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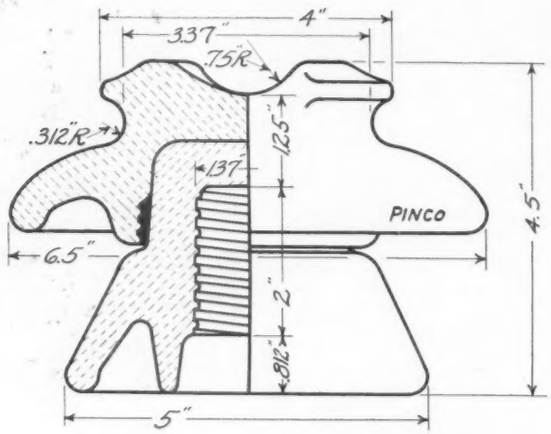

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A semi-monthly chronicle of western events, advocating the economy, efficiency and convenience of electric power for all industries of the West—manufacturing, agricultural, mining, merchandising, home building and home making. Interpreting the value of electrical development to the business and financial man, the industrial man, the power man, wholesaler and retailer, contractor and constructor, engineer and home owner.

Because of the abundance of water power in the West susceptible of economical development, a dependable, uninterrupted supply of cheaper electric power is assured for these industries. The basic industry of the West—hydroelectric power generation—for which Journal of Electricity and Western Industry is the spokesman, is therefore logically and inseparably linked to the growth and prosperity of all phases of our daily life and business.

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Journal of Electricity and Western Industry

A McGraw-Hill Publication

ROBERT SIBLEY, EDITOR

Associate Editors

Norman S. Gallison Clotilde Grunsky George C. Tenney

Vol. 48, No. 9 SAN FRANCISCO, MAY 1, 1922 Per Copy, 25 Cents

Supporting a Competing Industry With Tax Money

THE Water and Power Act, the proposed constitutional amendment to be voted upon by the people of California next November, contains provisions which make its defeat a matter of vital interest to every manufacturer in that state, since its passage would amount to the socialization of all industry. If passed, it would permit a politically appointed board of five men to engage in any business from growing peanuts to the operation of sawmills or drilling for oil. This unknown board with 500 million dollars of state bonds at its command, in addition to many other powers, would be specifically empowered to **"acquire, produce, MANUFACTURE or otherwise provide facilities, materials and supplies, raw or finished, and any property, or anything necessary or convenient."**

While the act is ostensibly created to allow this board, as a state agency, to go into the business of a water and irrigation company, and the business of a hydroelectric light and power company, it is permitted to go into any business that it thinks necessary.

This means not merely that the board might go into the business of providing cement or gravel, or power plant equipment, or manufacturing poles and electric appliances, but that under these provisions there would be nothing to stop it from manufacturing the cotton materials required in the households of its employes or from opening canneries or laundries to meet their needs. Nor does the law provide that they shall not go farther and sell material to the public. There is nothing which could not be included under this clause. It is further provided that there could be no appeal from the edicts of the board. Those industries which the board did not wish to "acquire" could be ruined by competition. And all this would be part of the fundamental law of the state incorporated in the constitution and not to be changed except by the cumbersome processes of the popular vote.

In this connection it is well to remember that to the board is delegated the additional authority to appoint as many employes as it thinks necessary and to fix their compensation as it sees fit. It takes no stretch of the imagination to visualize the amazing political machine which could be developed within these limits.

There is no need for the state going into the water and power business in the first place, it being efficiently administered by private companies. Government may properly regulate industry, but it must not invade its field as a competitor or as a monopoly. The functions of the state are political—there is now too much government in business. Such a proposal to set aside the principles of American government and to place more complete authority in political hands as is incorporated in the Water and Power Act was never witnessed in soviet Russia or in North Dakota.

The West Is Solving the Labor Problem

LABOR unionism has a history which is made up of a succession of strikes, practically all of them lost. And yet the movement has gone steadily forward, on the whole gaining in strength. Labor is no more satisfied today than it was ten years ago—the solution to the labor problem, from the employer's standpoint, does not lie in winning strikes.

On another page of this issue appears an article by a specialist in "industrial relations" who sounds a note of optimism in regard to the western position between employer and employe. He makes plain the fact that in the end it is the individual employer who must solve his own problem—and that he must solve it by considering it seriously during periods free from industrial strife. It was Disraeli who said "War is never a remedy—it is an aggravation." The same might have been said of a strike, however it ends—all constructive work must be done in the intervals. The labor situation in the West, owing to the few large industrial centers, and also to the friendlier relationship between workers, has never been as acute as in the East. The present tendency of western employers to study the problem and to grant concessions, of their own volition, during such periods as the present is a tremendous safeguard for the future and augurs well for the industrial prosperity of this district.

Why Not Develop a Western Iron Industry?

THERE are few industries on the Pacific Coast which suffer from the lack of an abundance of raw materials. There is, however, one major field which stands in that position, namely, the metal industry, whose greatest problem is to find in this western country good coking coal or to devise a commercially profitable means of refining iron ore without the use of coking coal. Throughout the West are great deposits of high grade iron ore easily available for mining and transportation. But nature

has not supplied one of the essential elements for refining—namely, good coking coal free from sulphur. The use of electric current and crude oil in this connection has not yet been worked out to full satisfaction.

A letter to the editor from an engineer with European experience appearing under this date, suggests that a similar problem has been met by Sweden with methods which might find application on the Pacific Coast. In that country the use of charcoal from lumber waste, combined with the use of electric furnaces has developed an industry of tremendous magnitude.

The whole matter is one of tremendous importance to the West—and one which should receive due attention in research. Owing to climatic conditions and other advantages of this region, it is possible to carry on the manufacture of all kinds of metal products under the most economical conditions, and with a cost of raw materials no higher than in the eastern centers, the West could undersell them in finished products. Is not the matter of such importance that the western states could afford to make definite appropriations to study the problem, probably through adequately supported research carried on by the mining and engineering departments of the state universities?

Pubic Relations in the Lumber Industry

THE lumber industry, no doubt in common with most other industries, has for some years been suffering from the fact that it is usually not understood by the public in general, and in particular not by certain representatives of the public in various governmental legislative and executive positions. This misunderstanding is due in part to the general agitation against corporations which is always in progress, conducted by one element of the soap-box press, and undoubtedly also in part to the recent recriminations and shiftings of the blame for the high cost of living indulged in between industries.

The public has the mistaken impression that the lumber industry has made and is making enormous profits through the wilful devastation of the forest resources of the country. There is an organized movement under way to force the industry through legislative action to manage its forest lands in a way to make them permanently productive. It has even been suggested that, along with coal and oil, the lumber industry should be placed in the class of public utilities regulated by the Federal Government.

While there is great need for the development of a sound forest policy in the United States, the burden cannot be placed entirely upon the industry. The public is largely responsible for the situation which exists and until it realizes that it has a number of duties in the matter and is ready to assume them, no equitable or permanent solution can be worked out. Present timber owners in the main will always stand ready to do what can reasonably be expected of them.

The timber of the United States is being cut several times faster than it is being replaced by growth; the situation is growing more acute and it will become more so in the future. Something will be done sooner or later to provide for a national forest policy. If the public is not thoroughly informed of the facts of the situation it is apt when it does move, to take decidedly unsound and unfair action. There is urgent need for sound public education.

The Problem of Condenser Tube Corrosion

WHILE a great deal of thought and attention is being given to the development of our hydroelectric resources, it must not be forgotten that steam power installation is still one of major proportions in the West. Take the case of California as an example. Even among our central stations, not to mention industrial plants, there is something like 500,000 horsepower in steam generating equipment as compared with 1,000,000 horsepower in hydroelectric equipment. Hence, the subject of increasing economy in the boiler room is still a matter of prime importance. Condenser tube corrosion in those steam plants that utilize salt circulating water in surface condensers is a problem of long standing, and yet the causes and remedies for this trouble are still little known. Much interesting research has been performed, and many theories have been advanced and remedies proposed, but in spite of the vast number of investigators who have labored on the question, it appears that the solution is not yet achieved. A new installation of tubes remains to a certain extent a gamble, and corrosion continues to be one of the most vexatious problems of the central station. Not only does this problem concern central stations, but all those who use surface condensers in industry generally, and it is to be hoped some definite research will be undertaken to meet this situation with sufficient impetus back of it to really see the problem through.

Improvement in Radio Broadcasting

BY far the most popular subject of conversation these days is "radio." Golf, business, prohibition, and the soldier's bonus have all taken back seats as far as conversational material is concerned, and even baseball, that monarch which received pages of publicity in former years, is being condensed in the newspapers to make room for radio news. Whether the sudden wave of popularity is transitory or not is problematical, but at the present time radio sets on the market are as scarce as the proverbial hen's teeth, and manufacturers have sufficient orders booked ahead to insure several months of capacity production.

Like all industries of mushroom growth there are many evils to be corrected before perfection is reached. Everyone who is familiar with the strides which have been made in radio transmission in the past year or two believes that the ultimate possibilities have not been attained. Of more immediate

interest to the average householder who has installed a set is the question of whether it will be of any use to him for other than a few days of amusement. As soon as the novelty of hearing "canned music" from the air wears off he is apt to return to the phonograph where he can make his own selections and be free from annoying interruptions. Provided he has not installed an amplifier or loud speaking attachment his family may also tire of sitting in a rapt and attentive circle, as they are almost always pictured in the advertisements, each with an individual receiver on his ears.

The efforts of the Pacific Radio Council and other bodies to restrict promiscuous sending and limit the wave length used by amateurs, as well as standardize the hours and improve the quality of concerts and other broadcasting activities will receive the hearty endorsement of all radio enthusiasts, which means almost everyone.

The Association on Associations

THERE has been for some time considerable criticism within the electrical industry of the avoidable duplication of effort in the activities of the industry's many associations. Now comes word that the Society for Electrical Development has made a move to eliminate the waste of time and resources by appointing a committee to request every other national association in the electrical industry to appoint representatives to serve on a joint committee to discuss and define the most constructive and logical fields of effort for each association, and effect an agreement which will eliminate overlapping of effort. It sounds rather complicated but is a move in the right direction, provided that the other associations will cooperate with the Society for Electrical Development in carrying out the proposed plan.

It is hoped that the move will be supported enthusiastically and in such a manner as to hasten action and results. Otherwise the committee may prove to be but another "association of associations" in the already overpopulated field.

Business Cycle Study by Federated American Engineering Societies

NEWS that the Federated American Engineering Societies have started to accumulate data to show steps that have been taken by industry to smooth out the business cycle, will be followed with interest by business men in general. This request comes from Herbert Hoover, former president of the Federation, under whose leadership that illuminating volume, Waste in Industry, was compiled. Each member organization of the Federation will be asked to cover the industries in their locality, and a special committee of the Washington society has been appointed to take charge of the work in cooperation with the Federation.

Economists have long contended that in the disposition of surplus profits accumulated during prosperous times lies the solution of financial strength and credit in times of stress. The past few years have witnessed a wider popular appreciation of economic laws than ever before. A fuller understanding of all the intricate relationships of production and distribution by the largest number of business men will produce the perspective essential to the ultimate smoothing of the business cycle.

The Federated American Engineering Societies hold that "Engineering is the science of controlling the forces and of utilizing the materials of nature for the benefit of man, and the art of organizing and directing human activities in connection therewith." The result of a survey by this able body cannot but add to the increasing knowledge of "business cycles, their cause and prevention," and will furnish an accurate index as to the extent which business and industry are seeking to eliminate periods of inflation and expansion and their inevitable aftermath of depression.

The Public Sentiment Against Futuristic Landscape

JOHN SMITH, who represents the public, is the person to whom all advertising is addressed. To catch his fancy, street corner billboards blossom into multicolored frenzy and newspaper and magazine pages shout aloud the most arresting phrases the copy writer can devise. All of which, John, being a human sort of a chap and interested in what goes on about him, rather enjoys. At any rate, he lets it influence his conduct to the extent that it pays the manufacturer to spend much money in thus challenging his attention.

But there is a limit to all good things. John likes his Sunday ride—or walk (depending upon his pocket book and the age of his walking muscles)—and he has as good an eye for the beautiful in nature as the next man. Pick any westerner at random and ask him to talk about the beauty spots of his state. The extent of his vocabulary and the depth of his feeling will astonish you. We believe the present day advertiser underestimates this trait in the man he is endeavoring to please. John—and his wife Mary, too—kodak as they go, but the photograph of the family group against a background of apple blossoms is somewhat marred, to their thinking, by a signboard urging them to purchase winter underwear or eat pickles of a given make and quality. They take along their lunch as a rule, but even ham sandwiches taste much less sweet when eaten in the shade of a mammoth tire which never slips even in wet weather. It has gotten to the point now where an almost solid line of advice in billboard form flanks the principal highways of western states and there is no vista remaining which has not its word of counsel—nay, command—to the possible purchaser.

There is more feeling against the country billboard than most manufacturers realize. There has even been some talk among the more ardent nature lovers of boycotting manufacturers who desecrate favored beauty spots. In the end of course, the desire of the public will prevail. This is just a hint to those spending money for advertising as to one of the present tendencies of John Smith's opinion.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

Reduction of Minimum Wage in California

After a number of hearings before the State Industrial Welfare Commission and much research and investigation into costs of living and budgets, the minimum wage for women and minors in certain industries in California has been reduced from sixteen to fifteen dollars per week. This reduction which will be effective on June 12th applies only to those employed in general manufactures, fruit and vegetable canning and packing, fish canning and unclassified industries. It does not apply to mercantile, laundry, hotel, restaurant or office workers.

The California Manufacturers' Association, at whose request last November the investigation leading to the reduction was instituted, based its claim on the fact that there had been no reduction in minimum wages since the war, since which time costs of living had declined. It was also pointed out that in industries employing seasonal labor, largely unskilled, that wages were out of line with the selling price of the products.

It is natural that wage cuts should be opposed by laborers but the costs of labor are among those that have declined least in the general readjustment which must occur before normal business conditions can be resumed, and the minimum wage is only the lowest possible wage which may be paid. Skill and experience are entitled to recognition, and receive wages in proportion.

Northwest Cities Building Record Shows Increase

The Pacific Northwest, which has felt the business depression as keenly as any section of the western states, is showing unmistakable signs of recovery. The effect of increased activity in building construction has had a salutary effect on the lumber market, the unemployment situation and on general business. During March Seattle was among the eighteen cities in the country that made the greatest increase in building activity. Permits numbering 968 and valued at $1,791,670 were issued; being an increase of ninety-four per cent in value compared with March, 1921.

It has been estimated that during the first week in April there were 2,500 residence buildings under construction in Portland, valued at $7,500,000. During March 1,388 permits were issued valued at $3,162,855, an increase of one hundred and seven per cent in value compared with March of last year.

The principal activity in both cities has been in new homes, rather than in office buildings, apartment houses or large construction projects. In both centers there are a number of large business structures which are planned, but which, it is reported, will not be erected under the present unfavorable labor conditions. The principal bone of contention between prospective builders and contractors and building trades unions is the question of wages.

According to figures compiled by the Federal Reserve Bank of San Francisco, in twenty cities in the states embraced by the Twelfth District, there has been an increase of twenty-two per cent in number and seventy-six per cent in value of building permits issued in the first three months of 1922 compared with 1921. The total value of the permits issued in these cities during March, 1922, was the largest on record, totaling in excess of twenty-seven million dollars.

The West and Its Relation to World Affairs

Recovery in western industry depends primarily upon increasing prices for the basic raw materials of commerce and a reduction in costs of distribution and manufacture of these materials. The manufacturing interests of the Pacific Coast are growing in importance, but the bulk of western activity—the lumber industry, mining, petroleum refining, fishing, meat packing, grain milling, and canning and packing of fruits and vegetables—belongs to the basic group of extractive industries whose efforts are directed toward placing a raw material upon the market in its primary form.

It is obvious, of course, that prices in this field depend to a large extent upon factors over which the West can have little control. Prices depend largely upon demand and, inasmuch as the principal products of this district have a world market, it is world demand which is controlling. No one district, not even the West, may effect a complete reform in such factors as currency stability, budget balancing and the cessation of political rainbow chasing. If these elements cannot be influenced locally, however, it may also be said that they are matters to which the entire world is giving its attention. The recent pronounced improvement in foreign exchange rates, probably the most sensitive barometer we have, is significant of the improvement abroad as is the curve of price increases in this country, which has been steadily upward since August, 1921, of better conditions at home.

Adolph C. Miller, westerner, and member of the Federal Reserve Board, spoke reassuringly as to the outlook for the West in a recent visit to the Pacific

Coast. Mr. Miller is one of the foremost economists in the United States and when he says that "things are on the mend" he speaks with authority. He also pointed out that the eyes of the world are on the Pacific and in this connection is reported to have said:

"The war has demonstrated that the world is contracting, and whether we like it or not we are getting closer to our neighbors. America cannot withdraw itself from the rest of the world. The Washington conference has shown that the front door of the United States is on the Pacific instead of on the Atlantic. The Atlantic is an inland sea, whereas the Pacific separates two widely divergent parts of the world. There is developing here on the Pacific Coast to a high degree a great international perspective."

Building Costs Compared with 1914 and 1920

B. C. Forbes, the business expert, has produced some interesting facts concerning building costs that show it cost two and a half times as much to build a home in 1920 as it did in 1914. Expressed differently, a two-story frame house which cost to build $5,529 in 1914 would have cost $12,815 in 1920, whereas it could be built now for $9,502. The following careful compilation is for a seven-room, two-story frame house 30 x 34 feet:

	1914	Peak, 1920	1922
Excavation	$ 240.00	$ 420.00	$ 420.00
Foundations and cement	470.00	1,459.00	1,167.00
Masonry	250.00	667.00	543.00
Plastering	359.00	262.00	892.00
Carpentry and glass	2,520.00	5,629.00	3,845.00
Painting	320.00	608.00	560.00
Plumbing and gas	350.00	686.00	517.00
Heating	400.00	1,029.00	712.00
Metal work	180.00	455.00	291.00
Tile work	40.00	87.00	54.00
Mantels	80.00	173.00	109.00
Electric	250.00	500.00	377.00
Hardware	70.00	140.00	98.00
Total cost,	$5,529.00	$12,815.00	$9,902.00

Cost per cubic foot, 1914, 0.19; peak, 1920, 0.44; 1922, 0.325. Per cent of change, 100%.

Forbes argues that we are reasonably assured there will be no material decline from these cost figures this year and that the wise man inclined to build will not defer action.

The Colorado River Question National Issue

Whether an equitable distribution of the benefits which may accrue from the development of the Colorado River can be made between the states in the Colorado River basin, is a question which time alone can tell. Secretary Hoover is of the opinion that such distribution can be equitably made. Despite the fact that there were no direct results accruing from the Secretary's recent western visit other than the removal of some of the objections which the upper river states had raised to the proposed development, indirectly much was accomplished. The personal investigation of Mr. Hoover, by the tremendous publicity which resulted, served in a measure to fix in the public mind the importance to the West and to the nation of the economic development of water power resources. It served to focus the eyes of the nation, if but for a moment on the growing importance of electric energy. The newspaper accounts of the recent Colorado conference, which received national publicity, in explaining the purpose of the conference told the people of the eastern states something of what the West has accomplished. This alone was worth the visit. As soon as eastern manufacturers as a group realize what a few far-sighted ones have grasped, namely, the market opportunities, ideal climatic conditions, and future industrial possibilities of the West, the inevitable destiny of the West will be on its way to attainment.

Colorado Decision on Highway Use by Heavy Motors

Declaring that motor stage operators have no right to convert to their own profit the money paid by taxpayers for the construction and maintenance of highways, the Public Utilities Commission of Colorado has handed down a momentous decision which will form a precedent for decisions in similar cases by other state public utilities commissions.

The Colorado commission made an investigation of the transportation conditions in Eagle and Garfield counties, through which bus lines wish to operate, and found that in the two counties, although there were sixty-eight motor trucks operating as public carriers, they paid into the state treasury only $819.27 per year for the use of the state and county highways.

The Denver and Rio Grande Western Railroad, which these buses parallel, paid during the same period $38,023.94 for the public roads, and in addition, other taxes making the total in these two counties by the railroad company, $153,896.94.

The portion of the decision which is of special import is that defining public convenience and necessity, which is as follows:

"Public convenience and necessity, by which must be understood the convenience and necessity of the people at large as contra-distinguished from the convenience and necessity of a very small number of persons who seek to derive a profit from the farmers' and home owners' investment in roads, never contemplated that the truck driver should destroy that, to the cost of construction of which he contributed little or nothing, or that he should reap where he has not sown. When the taxing laws of this state are so amended that the truck driver operating over state highways shall contribute his due proportion to the cost of construction and maintenance of our highways, then, and then only, can this commission regard his use, under proper conditions and restrictions, of a great and tremendously expensive public facility as of equal dignity and equal benefit to the people with the moderate use thereof by the ordinary taxpayer."

Letters to the Editor

Need for an Expedition to Study Swedish Iron as Model for Western Development

To the Editor:

Sir: It is a well recognized fact all over the world that Swedish charcoal iron stands at the very top of iron products. I want to call your attention to the fact that the conditions that exist today on the Pacific Coast are practically identical with those which occur in Sweden, as to the iron industry. We have here large deposits of high grade iron ore; we have large timber stands producing an enormous amount of waste material; we have abundance of hydroelectric power which, if treated correctly, would produce and supply cheap electric power.

In Sweden the iron industry relies on charcoal as its reducing agent, and until the electric furnace was introduced, charcoal blast furnaces were exclusively used for producing pig iron there. In 1910, or thereabout, the electric shaft furnace was developed, and since that time about 40 electric shaft furnaces have been placed in operation there, and it is reported that as soon as one of the old-fashioned blast furnaces goes out of commission, it is supplanted by an electric shaft furnace.

The reason for the use of an electric shaft furnace is primarily the fuel economy, and also the quality of material produced. The fuel economy is of course a vital question, especially in a country where the reducing agent, such as charcoal, is produced from growing materials at considerable cost. The underlying fact is that when operating a common blast furnace, two-thirds of the fuel is used for the purpose of heating the charge by combustion, and one-third of the fuel is used in doing actual chemical work—in other words, reducing the oxide to metal. Consequently, in the electric shaft furnace the electric current supplants two-thirds of the charcoal necessary to produce the iron. In other words, the same amount of charcoal will produce two-thirds more iron in an electric shaft furnace than it would produce in a blast furnace—a very large economy.

In my opinion, it is a great mistake for us out here to try to imitate the industrial conditions existing in Pittsburgh, Pa., or similar localities. We have not the pre-essentials for such undertakings, and on that account will never be able to compete economically with their manufacture. The only sound method of developing an iron industry out here, under our conditions, is to follow closely the lead of the Swedish iron industry, whose product is world famous today. Swedish iron could be produced equally advantageously out here on the Pacific Coast, and should be known as "California" iron.

Pig iron is a semi-finished product—consequently, the margin of profit on pig iron is small, and the financial success of a plant producing pig iron only, is dependent exclusively on the bulk of the output. The logical and sane way for the development of the iron industry here, therefore, is not in the manufacture of pig iron as such, since there is a small market, if any, for the type of pig iron produced in electric shaft furnaces. Pig iron on the Pacific Coast is principally of a low grade product, which will readily absorb into itself steel scrap, producing, in such a way, an acceptable foundry iron. Consequently electric shaft furnaces producing pig iron should be economically associated with the refining of the pig iron produced, and the final manufacture of steel products readily salable out here, such as angle iron, reinforcing brass, etc.; tool steels of various kinds, also wire, nails, and a multitude of other smaller steel products which find a ready market on this coast.

As you know, I have made a very careful study of the iron industry, both abroad and out here. I have found it practically impossible to talk intelligently with most people in the West, due to their lack of understanding with regard to the conditions surrounding the Swedish iron industry. The only way the full understanding could be obtained by the people out here of the soundness of the Swedish iron industry and the soundness of its application to the Pacific Coast, would be for them to send out a commission from here to study in detail on the ground, the economical as well as the technical side of the iron industry.

I would be very pleased to cooperate with anybody that is interested along these lines.

J. W. BECKMAN, President.
Beckman and Linden Engineering Corporation.

Why Not Educate the Public to Change Fuses and Save Money on the Electric Bill?

To the Editor:

Sir: If anyone wanted to know how important a part electricity plays in our home and business life, he should take a turn at the trouble-call desk of a power company and listen to the complaints and the urgent calls for help as soon as the lights go out.

Every electric light company is well aware of its great responsibility in this respect and tries hard to keep this little world of ours on its proper course. And yet there is not 2% of this trouble that is caused by any fault or neglect of the company or by the failure of supplying electricity. Most of these calls come from homes, with faulty irons and cords as the most common causes. In the stores the cause is generally an increase in the size of the lamps or in the amount of lamps, which means an increase in current consumption and an overload on the capacity of the fuses. But in most all cases the renewal of fuses is all that is required to restore the service.

Years ago when the customers were few, free service for such calls was established by the power companies and has been maintained ever since. With the increased use of electricity, this free service is costing the light companies thousands of dollars every year. What is more, from the often amusing, and often aggravating and trying calls, it would seem that not very many appreciate fully this service.

What is at the foundation of all this helplessness on the part of the public? It is a most pitiable ignorance, an ignorance which is not warranted in this enlightened age—and a little propaganda of enlightenment on "How to help yourself" is surely needed.

Years ago, when electricity was less known and little used in the homes, people were afraid of it, but nowadays with electricity taught in every school in the land, with all kinds of electric appliances used in every home and electricity used everywhere, this fear and ignorance should not exist any more and a simple knowledge of applied electricity should be common in every household and to every business man.

How much inconvenience could be avoided if every householder knew how to locate and replace a burned-out fuse? It is more simple than lighting up an oil lamp and everyone knew how to do that, without burning their fingers or setting the house afire! This ignorance almost borders on the criminal when a big apartment house becomes affected or, as it even has happened, that a hospital was in darkness for some time because nobody in the place knew how to replace a fuse or even knew where the meter and cutouts

were located. There are storekeepers today that have never taken the pains to locate their electric meters and cutouts.

Why should some apartment house owners be allowed to put this burden of light maintenance on the shoulders of an electric light company any more than they would put the heat maintenance on the coal dealer?

The remedy for this helplessness is, to educate the public through simple printed instructions or by demonstrations given by the electrical contractor, dealer, or by the electric company. And as charity begins at home, every one of the employes of the above mentioned concerns should know or learn how to help themselves.

The electric light company should find it very easy to start this educational campaign, as the monthly bill cards could be employed as a little messenger, carrying a few simple rules of "How to help yourself" to every household. These rules could be printed on cards like the meter reading instruction cards and distributed to every one asking for them, as well as left in the places where the trouble man makes a call or the meter man sets a meter.

It is the conviction of the writer that this educational campaign would prove beneficial to all concerned and if carried on for some time, no man with the average intelligence would call for the trouble-man except in cases where his own efforts have failed to get results.

JOHN W. MELHORN, Operator.

San Diego Consolidated Gas and Electric Company.

Notes of a Western Engineer on Conditions in Europe from an American Viewpoint

To the Editor:

Sir: During my recent trip to Europe I jotted down various notes on my observations, some of which have bearing on western situations and may be of interest to your readers.

Times are slack in all different European countries, with the possible exception of Germany—and conditions are by no means rosy in Germany. The great mass of the German people are poor and living conditions are hard for them. One is apt to think that things even in the United States are not what they used to be before the war, especially in regard to labor efficiency—but this is true to a much greater extent in Europe, even in countries which did not take part in the war. I was surprised to find great apprehension in Germany as to their ability—or rather inability to compete with U. S. manufacturing concerns in the open market on the ground of the lower efficiency of their labor compared to what it had been before—and compared with American systems and labor conditions. In America I had heard just about the same story before I left on my trip, only it was American concerns being afraid of German competition.

The Swedish government is constructing two multiple arch dams 60 miles above the Arctic Circle. On account of the extreme low temperatures at this latitude, special care is taken with the reinforcement. Construction work often has to be continued even at very low temperatures in order to finish the work within a reasonable time. There are no railroads in the country for the last 100 miles. The men are brought in by airplane (in charge of a man who was Colonel in the English Flying Corps during the war) and the material is brought in on barges (in charge of a former German submarine Captain). The work as a whole is in charge of a bureau—or what amounts to a committee of engineers. It seems to be general practice to send an engineer to the United States every now and then to study the latest developments in the various branches of engineering and then to introduce all possible advantageous improvements at home. In certain lines, business interests in the United States could benefit by doing the same thing—that is, by sending engineers to study in Sweden.

When in Sweden I visited a large cable works where submarine cables for voltages up to 35,000 were made as regular standards. I have always been impressed with the fact that the United States was leading the world in everything electrical, with but few exceptions. Among these exceptions are high voltage submarine cables. There is no sufficient reason, for instance, for keeping the voltage of the submarine cables crossing San Francisco Bay down to 11,000 volts, other than that home factories are not willing to go any higher. It is certainly not an economical voltage for the power companies, although I can readily see that it is for the cable manufacturing companies. The Swedish factory has made and laid several 35,000-volt cables, one of them in water as deep as 330 ft. Twenty years ago there were cables in Germany operating at 30,000 volts — and they are still working.

The war has brought great changes in Denmark. Although the country directly profited by the war, prices are very high, a fact which is difficult to explain. It seems that the government owns and operates nearly all large enterprises, such, for instance, as the railroads—and does it very uneconomically. The railroad fares, third class, equaled first class in the United States. One would think that in a densely populated country such as Denmark, railroading would be a good business at fair rates—but even with their very high charges, the Danish railroads are now run at a loss. The same is the case with street car operation in Copenhagen, but that kind of business seems to be bad almost everywhere.

The first thing I saw on arriving in Edinburgh were big signs saying "Prohibition works against personal liberty, therefore vote no change." There had evidently just been an election on prohibition. It did not carry—it was wet everywhere I went—even the climate. The Scotch had evidently decided on no change. Before this trip, I personally was against prohibition as being actually against personal liberty, but I have now come to the conclusion that from a national point of view it is not bad—and one should really look at it that way.

The hydraulic laboratory of the University of London is very well fitted out and students are working there from every country of the world, including Japan. In the laboratories for testing material there is much empty space, which I was told would remain empty until the exchange went to normal—then it was to be filled with American testing machinery which was known here to be the best obtainable. Some very interesting tests on reinforced concrete arches have been made in the laboratory. An arch with a height of about 10 feet had deflected 3 inches and come back again. According to calculations, such deformation should not be possible without crushing the material.

In making estimates, it is surprising to find how near the cost of hydroelectric construction comes out the same in various countries under similar conditions as to location in the mountains. If labor is cheap in a country, one can be sure that this labor is also inefficient and does not produce much.

As a general rule, electric power costs the consumers considerably more in Europe than in the United States, with the possible exception of Norway.

Any trip to Europe at this time must be both interesting and beneficial—it also teaches one the advantages of living in the United States.

LARS JORGENSEN,

San Francisco, Cal. Consulting Engineer.

Builders of the West

IN the upbuilding of a great and prosperous industrial empire, capital and industry must go hand in hand, and the growth of an industry in any community is largely dependent upon the vision and judgment of its financiers and bankers. In the banking circles of the Pacific Northwest there is, perhaps, no other one man whose advice and opinions in financial and banking matters have been so eagerly sought after, and who has proven such a stabilizing factor as A. L. Mills, president of the First National Bank of Portland, Oregon.

A. L. MILLS

Who, as president of the First National Bank of Portland, one of the Northwest's largest and strongest financial institutions, has devoted forty years in aiding the development of the western industrial empire through judicious supervision of the finances in one of its most progressive districts.

Mr. Mills was born and educated in New York. He was graduated from Harvard University with the class of 1881. It was in 1882 that he turned his footsteps westward toward Oregon, even then a semi-primitive country holding forth the same glamor and romance as it did in the days of Lewis and Clark. His first venture in the new country was as a stock-raiser in Yamhill county. It was then that he learned of the dependence which the agriculturist and cattleman must place upon his banker. It was but a short time later that he forsook farming and went to Colfax, Washington, where he entered the banking business. It was in 1890 that he came to Portland and organized the Security Savings and Trust Company, himself taking the active direction of its policies and affairs as vice-president. The Pacific Northwest, in its earlier days, was looked upon rather dubiously by the financial interests in the East who were in a position to aid in the development of its vast natural resources. It was the pioneering instinct, the conservativeness, the stability and foresightedness of such men as Mr. Mills who directed local capital in the development of the great agricultural, cattle and sheep raising industries, the utilization of the vast forest resources, the opening of the mines and the growth of the fisheries.

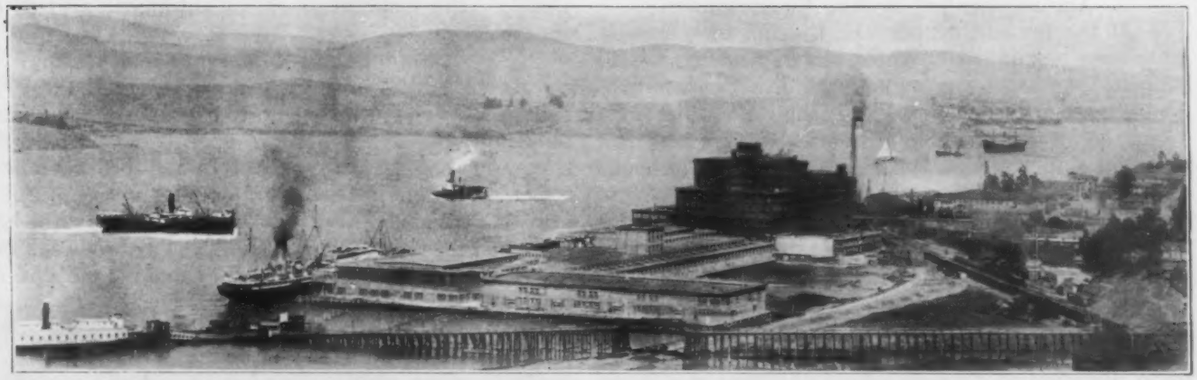
For the past forty years, Mr. Mills has been closely identified with the upbuilding of the industries of the great Northwest. Assuming the presidency of the First National Bank of Portland in 1903, for the past two generations he has been prominently linked with almost every constructive enterprise in that section of the progressive West. His advice and judgment on matters of finance and business are appreciated, not only locally, but in the East where he is regarded an authority on financial matters.

As a reader and student of history of economic problems he has devoted much thought and study to banking legislation. He served in the Oregon State Legislature as speaker of the House, from 1903 to 1905, and has been credited for a large amount of the banking legislation now on the statute books of the state. He was a member of the Federal Advisory Council from the Twelfth District, serving with distinction in that capacity for three years.

Although held to be highly conservative and often criticized for his conservatism, his exceptional farsightedness and keen judgment have many times been proven. As a leader of public thought, his opinions have always been highly regarded. During his administration the First National Bank of Portland has come to be recognized as the largest and strongest financial institution north of San Francisco and west of Denver. Much credit is due to him for helping to avert a serious financial panic in Portland in 1907.

For all his responsibilities and active business life, he is a man of genial personality and counts among his friends hosts of men to whom he has been of vital assistance during their business careers. Nor has all of his time and activity been devoted entirely to business. His interest in the welfare of his fellow men has taken him into other fields. He is president of the Portland Open Air Sanitarium and a director of the National Association for the Study and Prevention of Tuberculosis.

Because then of Mr. Mills' contribution to the upbuilding of the West, not in the organization of a large industry, but in helping to finance industry and point the way to success, this issue of Journal of Electricity and Western Industry is affectionately dedicated.



The Crockett refinery of the California and Hawaiian Sugar Refining Corporation on San Francisco bay, where electricity has been scientifically applied to solve many difficult problems. The refinery is reputed to be the largest in the world, handling 2000 tons daily. It is capable of refining the entire crop of the Hawaiian Islands. The plant is admirably situated as far as transportation facilities are concerned. Half a dozen steamers can discharge raw sugar at one time along the 3000 feet of deep water dockage space while the entire season's output of 600,000 tons is practically all placed in cars for shipment to various parts of the United States. At no time does manual labor enter into the handling of the bags of sugar, electrically operated material handling devices doing all this work.

Applying Electricity Scientifically to Factory Problems

An Example of What Can Be Done in Adapting Electricity to the Special Needs of a Factory as Illustrated by the Modern Equipment and Carefully Planned Layout of the California and Hawaiian Sugar Plant

By LOUIS F. LEUREY
Industrial Electrical Engineer

THE sugar refinery of the California and Hawaiian Sugar Refining Corporation at Crockett, California, is one of the largest industrial plants on the Pacific Coast, and in extent and diversity of electrification is at least the equal if not in advance of most industrial plants in America.

The use of electricity in manufacturing is divided into two general classes. In the first of these classes electricity is used as a motive power doing the work which was formerly done by steam engines, gas engines, and other prime movers. In the second of these classes, electricity is used as a medium for the accomplishment of industrial processes. The use of electricity as a motive power is the one most generally observed in current industrial practice, as this type of application can be most readily promoted by the electrical power and manufacturing companies who have pioneered the applications of electricity in the fields of manufacture. In the second case, both manufacturers and power companies have been handicapped in securing the application of electricity in process work, due principally to the fact that these applications call for an intimate knowledge of the industrial process. The manufacturer himself shows little inclination to initiate any advanced use of electricity and generally depends upon outside suggestion.

As the electrical manufacturer and the industrial plant manager do not speak a common language, in the technical sense, it is not surprising to find that electrical applications of a process character find their widest application in those plants that have on their staff or retain electrical engineers, capable of thoroughly interpreting the requirements of the electrical industry and of the manufacturing companies to each other. The California and Hawaiian Sugar Refining Corporation have such an organization and the extent and success of their electrification should be of interest to any other types of manufacturing because the underlying principles are, after all, common to all types.

Source of Electric Energy

At the refinery at Crockett, the character of the refining process is such that a large quantity of exhaust steam is required for manufacturing purposes. Taking advantage of this condition, the company installed its own steam driven electrical generating plant. The exhaust steam from the turbine engines is used in the refining process while the electric energy, being in effect a by-product, is used to furnish power for all driven equipment. This power plant is complete with its own switchboards and operators and is, to all intents and purposes, a central station supplying an outside consumer.

The main feeders are all of a uniform size and are routed through the refinery until they accumulate a load equal to their capacity and no more. When further energy is required to meet extensions, a new and additional feeder is run from the central power plant. By this means the investment in electrical distribution equipment is all active and participating. In the same manner sub-distribution switchboards are established at convenient points in the refinery and the main feeders are broken up into smaller feeders capable of handling a single large motor or a group of small motors. In a similar manner these feeders are all routed in the refining areas so as practically to checkerboard the entire space with available sources of power. These feeders are all working up to their carrying capacity and give extreme flexibility in maintaining the changing demands as improvements occur in the refining process.

Arrangement of Motive Equipment

At the present capacity of the refinery, namely 2000 tons per day, 700 motors having an aggregate capacity of 10,000 hp. are connected in the network. These motors vary in size from 1 hp. to 350 hp. with 15 hp. as an average size. Practically all are of the common squirrel cage type, but due to the preponderance of small sizes which have inherently low power factors, about 1000 hp. in synchronous motors and static condensers have been installed as a corrective measure. The synchronous motors were connected to centrifugal pumps and air compressors where they were especially suited to the character of the drive, and the static condensers were put on main distribution feeders where the load was very variable in character, and of an exceptionally low power factor. With these corrective measures, the power factor of the central station has been raised from 75% to 82% with a corresponding increase in the capacity of the turbo generators.

Every square inch of warehouse space must be utilized at the refinery for storing the annual output of 600,000 tons. This is done by means of an extensive system of electrically operated conveyors, controlled from a central station. Manual labor is practically eliminated in stacking the bags of sugar. The "high pilers" in the above picture stack the sugar in tiers sixty bags high, enabling the storage of approximately one ton of either raw or refined sugar per square foot of warehouse space.

In installing the starting equipment on motors, standard steel supports were designed which carried not only the starting equipment equipment but a disconnecting switch of the externally operated type. This equipment is all arranged for ready removal, as a unit, from one part of the property to the others as the changing demands of manufacturing may require. The disconnecting switch at each motor offers a safe and quick method of making a routine inspection of motor and starter with a view to forestalling interruptions in operation. The control equipment is all designed to minimize the effect of accidental shutdowns and a complete signal bell system is installed between the various sugar stations to facilitate speedy starting up. In special cases where a train of important conveyors all dump the product into one another, electrical interlocking devices are installed so that if the end or intermediate conveyor should stop for any cause, the interlock will also stop all other motors in the conveying train. In the warehouses where sugar is stacked 64 tiers deep and where 13 separate trains of conveyors are in service for handling the great tonnage of sugar necessary, a master system of control has been devised so that any units of the 13 trains can be grouped together by means of a plug switchboard. By this means they can be automatically electrically interlocked with each other. This system has not been put into effect to date because the accidental stoppage of the conveying equipment has been negligible and it has not been thought advisable to complicate operation under these conditions by the installation of an automatic system of control.

Signals and Communication

In order to coordinate properly all of the diverse functions of the refinery and to overcome quickly any interruptions to continuous operation, a complete signal and communication system has been installed.

In addition to the signal bell system noted in a previous paragraph an extensive calling system has been installed. The central station for this system is located in the main office in the day time and at the gate house at night. From these stations an automatic code is sent out through loud sounding bells and horns in every section of the property. In order to make this calling system effective a comprehensive telephone system was installed to parallel with it so that the men being called could immediately get in touch through the nearest telephone with the central office and get instructions.

A fire alarm system of the complete automatic type and self supervising is in operation and this system is also used to blow a standard time signal from the factory whistle.

In addition to the above communication systems a telautograph system has been installed between the central office and the shipping and receiving departments for transmitting written instructions. A Lampson tube system is also in operation between the office and the shipping and receiving departments for the transmission of documents.

In order to keep the executive offices and the production manager in complete touch with the refining process and in order to keep an accurate account of the product, a complete electrical counting system has been installed. Having failed to find an existing counting apparatus to meet their exacting requirements, the electrical department in conjunction with a local manufacturer, developed a splendid counter by adapting the parts of an electrical maximum demand meter. By the installation of contact triggers of substantial design, these instruments are now faithfully recording sacks of sugar instead of kilowatt-hours. Many of the points of count are at remote distances but all of the counters are located at central positions in the refinery where they both indicate and record the complete flow of sacked product through the factory.

Special Applications of Electricity

In addition to all of the applications of electricitity, both as a motive power and as a medium, noted in the above paragraphs, the California and Hawaiian Sugar Refining Corporation is continually

investigating new forms of applications tending towards the most complete usage which can be economically secured. Naturally in a refinery using both steam and electricity, great care must be exercised in maintaining a balance so that a surplus of exhaust steam shall not occur, as this very rapidly and seriously affects the economy of the entire plant. Consequently, on all heating applications this balance is kept in mind. In the box drying plant where wooden boxes must be thoroughly dried for the receipt of powdered sugar, the advantages of electrical

Twenty-two direct connected centrifugals are operated from this single motor control board. Each is operated by a 30-hp. motor. The centrifugals are self-discharging. This is but one portion of a control system that has eliminated waste labor and the enormous upkeep of an elaborate system of line shafting and belting. Above the control board is a portion of the electrically operated signal system.

control were so manifest that it was adopted for this entire section of the plant. A large number of electrical heaters are installed in this section of the plant for maintaining dryness in the box wood and a fine control is secured by a horse hair humostat which actuates a sensitive relay and through this relay controls contactors that cut in and out sections of electrical heaters. This system has been in operation for several years and runs with only a nominal cost for attendance. A certain amount of office and hotel heating is done electrically where it has proved uneconomical to extend the steam mains, and a complete electrical shop with ovens for drying motor windings and a complete electrical test equipment installed. Both oxy-acetylene and electrical welding are found side by side in this refinery, each doing the class of work for which it is preeminently suited. Many special electrical controls for automatically operating syrup gates and valves are either installed or in the process of installation and extensive experiments are under way in an attempt to regenerate electrically Kiselguhr and Bone Char, two of the most expensive operations in the sugar refining process. This work of regenerating is now being accomplished by means of direct oil fired furnaces. While the heat content of electric energy per dollar is not comparable to the heat content of oil, the heat in the energy can, however, be applied with vastly increased efficiency and there is hope for a successful termination of these experiments.

Anyone who has viewed the refinery from the Stockton river-boats or from the main lines of the Southern Pacific has always commented on the spectacular quality of the night appearance. This appearance, however, is only an incident in the design of the illumination for its main purpose was to permit the manufacture of sugar as successfully at night as could be done in the day time and 20,000 lighting outlets have been installed.

Electrical Maintenance and Operation

The whole electrical operating department at this refinery is trained to carry out these two primary principles of good operation:

First—Forestall all possible trouble by rigid program of inspection and upkeep.

Second—Be prepared with complete equipment and exact instructions to handle shutdowns when they occur.

To accomplish this the operating electricians are each given a definite area or class of equipment within the refinery for which they are made responsible and a routine of inspection duties is outlined for each man with a thorough system of reports.

Building For the Future

The greater part of the success which this company has secured in such an advanced type of plant at Crockett is due to the broad and far-sighted policy of the management in attracting to their service a

The main switchboard in the central power plant which controls the output of three 1500-kw. turbo-generator units, distributing the energy through the various portions of the refinery over sixteen feeders. Electricity is a by-product of the plant. Great quantities of low pressure steam are required in the refining of the raw sugar. Steam is generated at a pressure of 140 lb., run through the turbines, and discharged into the steam mains of the plant at a pressure of 10 lb. per sq. in. The turbines simply replace the low pressure reduction valves which would be necessary to prepare the steam for use in the refinery.

high-class engineering and technical staff. Not content with this, however, this same broad-gaged management went outside of their own organization to secure the cooperation of engineers whose experience had been in many other lines of manufacture and they have thus brought to the solution of their problem the group experience of the entire manufacturing and power field. By this policy not only do they reap the reward of a splendid and efficient plant in the present but have the assurance that for many years in the future they will still have a modern plant when less far-sighted contemporaries will be struggling with obsolescence.

Western Labor Relations on the Way to Sound Solution

The Special Advantages of the Western Labor Situation, Based on the Willingness of the Large Employer to Maintain His Interest in Bettering Conditions During Periods When No Labor Crisis Forces Concessions

By GEORGE L. BELL
Industrial Consultant

AFTER the industrial depression set in some time ago, when instead of a labor shortage there began to be a labor surplus, when the period of constant wage increases and general restlessness of labor ended, far too many industrial executives settled comfortably back in their desk chairs with a "Thank-God,-that-is-over" attitude, and began to devote their entire attention to the other problems of their business.

Fortunately, in western industries fewer managers seem to have swung to this extreme. This is largely due to the fact that in the West the pendulum never swung so far the other way in the matter of war and post war enthusiasm over the myriads of newly discovered cure-alls and paneceas for the problems involving the human element in industry. Because of the comparative isolation of its industries, the West was not so much affected by the epidemic of what might be termed fads in dealing with labor that affected eastern industrial plants. There many of the profit sharing and bonus plans, employe representation, and community welfare schemes, etc. were carelessly thought out and were adopted in haste and despair; and, unhappily, few of them were based on real convictions and deep sincerity of purpose. The natural outcome has been the precipitate abandoning of many of these schemes as soon as the balance of power returned completely to the employers. In the West industrial managers have "kept their feet on the ground," not because they are less progressive or less willing to try new ideas than their fellow easterners—for they are more inclined the other way—but because their labor problems were perhaps not quite so pressing, and because they are more inclined to deal with the substance than the form.

Going to the Dentist Before the Toothache

As an illustration in proof of the assertion that western employers have not gone from one extreme to the other in this period, may be cited the case of a large manufacturing concern in a one-industry town in the San Francisco bay district. In these unincorporated, one-industry towns, more or less a distinctly western development, there is a merging of industrial and civic life which presents mixed industrial relations and community problems. This company had created an employment and personnel department long before the war, gradually yet steadily developing its scope and functions, and had also given much attention to the erection of buildings and many facilities for recreation and community use, all of which were maintained and managed by the company. Long after the war a careful study was begun as to the manner of operating these community institutions, and the use made thereof by the employes and townspeople. Finally, in the very midst of the industrial depression, when not only the problem of labor turnover had ceased but when there was a large surplus of labor available, the company decided, as a result of the thorough survey, to turn over the complete control and management of all the club houses, the social hall, the athletic fields and parks to the employes and other residents—the company continuing to pay its same proportion of maintenance costs but retaining no veto power other than the right to forbid the sale or burning of the buildings! Whatever one may think abstractly concerning the wisdom of this action, it was an action taken on the basis of real conviction as to facts, principles and policy; and not a move based on hysteria and expediency, nor made with the desire of trying to placate restless workers.

The West in the Lead

The development of large industries in the West is comparatively recent. In the smaller plants the pioneer spirit has prevailed in both management and men, and the day-to-day, man-to-man problems were rather easy of solution. It is only with the coming of large plants, where the human contacts have become more remote and complicated, that the West has had to face really complex industrial relations problems. But even there the western traditions of virility and of "man fashion" dealing have exerted a real influence in working out adjustments to meet the new conditions. There seems to exist a fairly clear realization that there can be no static solution for these continuing, changing problems. But there is a static determination to create the proper sort of human attitude and human machinery for meeting these problems as they arise.

Because of this prevailing spirit there is a very real possibility that the West may lead the country in establishing and maintaining stable industrial relations, just as it has frequently led in inaugurating sound progressive civic and political movements. If western employers will generally continue to refrain from taking selfish and short-sighted advantage of present economic conditions, and will continue to do constructive thinking and to devote attention to the human element phases of their industries, they have a fine opportunity for establishing a national standard. It is in times like the present that the best permanent results can be accomplished, for both employers and workers are in a frame of mind which permits of sound thinking and frank discussion, based on facts rather than on emotions, and untrammeled by hatred and fear. Right now employers have the best opportunity of convincing the workers of the sincerity of their motives and objectives.

A happy instance of at least a hopeful collective attitude on the part of western employers is to be found in the actual accomplishments of the Industrial Association of San Francisco in connection with the building industry during the past six months. This association was organized last summer during a bitter strike and lockout in the building trades. It was initiated, not by the building contractors and employers, but by business men and employers generally for the purpose of protecting the interests of the community at large in this basic key industry. The men who organized it did not do so with the object of gaining unlimited power for the building contractors, who had worked steadily under closed shop conditions for over twenty years; nor did they aim to break the unions. Instead of frittering away their energies in raving against and worrying about the organizations of building trades labor, they concentrated upon organizing themselves for constructive work, for doing positive things rather than negative things. When the men went back to work under the "American Plan," the association, as a part of its program, saw to it that short-sighted contractors did not take purely selfish advantage of the new power in their hands. Furthermore, the association put into effect a real plan in connection with the announcement of the adoption of the "American Plan" principle—a thing neglected by many similar associations elsewhere in the United States. It did not arbitrarily cut wages, but set up an impartial wage board of prominent disinterested community leaders, which fixed a scale of building trades wages for one year; it maintained the eight-hour day, five-and-a-half day week, with time and a half for regular overtime and double time for Sundays and holidays; it maintains a staff, with field inspectors, to enforce the payment of the wage award of the impartial board, to prevent discrimination by employers against either union or non-union men, and to hear and adjust any complaints of union or non-union men; it is financing and operating training schools for the development of apprentices in the highly skilled trades wherein there is a serious shortage of mechanics.

While the association just referred to is always prepared for militant action to maintain the conditions established in the building industry, or to aid any industry to get on the same basis, yet it is not militant purely in the interests of the employers. It puts public interest first, and is endeavoring to maintain only the proper balance of power between employers and employes, realizing that absolutely unrestricted, unlimited power in the hands of either group in any industry is almost certain to be abused, and the general public made to suffer in the end.

Hopeful Outlook Through the Individual Plant

Of course the ultimate test in these matters will have to be met in the individual plants of the employers, where is located the real contact point, since general associations are in the main only policy-forming and educational. But it does seem that, in San Francisco at least, this educational campaign is headed in the right direction and is bound to have a good effect on individual plant managers. And, I repeat, there is a graifyingly large number of western employers who have not permitted a backward swing of interest in their personnel problems, and who are continuing to carry on constructive work in that field. While many eastern plants have summarily eliminated their industrial relations or employment departments during the past two years, most large western plants, which had such departments, continue to regard them as fixtures in the business, necessary as organized contact points of human relationship where the size of the work force makes it impossible for the employers or plant manager to serve regularly and effectively in that capacity. And, in cases where the magnitude of the enterprise does not justify the maintenance of an industrial relations department, there are hundreds of western industrial executives who are giving systematic attention and study to their employment relations and the proper placing of men, to the training and development of their employes, and to the careful carrying out of policies of fair dealing in the adjustment of wages and working conditions. Of course a great number of discouraging examples could be produced to show the darker side of the picture, but it seems more than probable that the views and policies of the forward-looking groups in western industry—though they may be considered, for the sake of argument, to be in the minority—will prevail, because they are based on sound common sense and on an analytical estimate of the relative importance of the factors entering into industrial production.

California City Operates Swimming Pool as By-Product of Municipal Power Plant

Power plants very seldom produce by-products, yet at Palo Alto, California, there is operated in conjunction with the municipal generating station a swimming pool which has become so popular that its discontinuation would bring a storm of protest from the entire community. It is an open air pool and is operated throughout the year with no charge being made for its use.

Its connection with the power plant comes through the heating of the water in the pool through turning the cooling water from the plant Diesel engines into it. Previously an attempt was made to cool the water from the engines by passing it through a cooler on the roof of the plant. This was unsuccessful and the hot water was turned into the city mains. The temperature of the domestic water supply in the vicinity of the plant was raised to such an extent that this practice was objectionable so the scheme of running the hot water into a swimming pool was tried out as a possible solution to the problem.

The pool is circular in shape with a conical bottom and has a capacity of 176,000 gallons. The Diesel engine requires approximately 130,000 gallons of water per 24 hours while 124,000 gallons of fresh water enters the tank in addition to that from the engines during each 24 hours.

THE MAJOR ARGUMENT FOR IMMEDIATE ACTION ON THE COLORADO

Airplane view of one of the danger points on the delta of the Colorado, showing how the river has left its channel at numerous points. The westerly end of the Volcano Lake levee is shown at the upper left. Every succeeding flood season makes the danger to the Imperial Valley region more imminent and relief is imperative if the river is not to top its levees with the next heavy rains. The picture was taken from a 12,500-ft. elevation by the Pioneer Aerial Engineering Company of Beverly Hills, California, and is copyrighted.

Controlling the Principal Artery of the Southwest States

One of the Foremost Authorities on the Colorado River Discusses the Situation Now Before the Colorado River Commission in the Light of the Future Industrial and Agricultural Possibilities of the Southwest

By C. E. GRUNSKY
Consulting Engineer

THE Boulder Canyon damsite is located just above the point where the Colorado River makes its abrupt turn from a westerly to a southerly course . It is some 60 miles in an air line above the point where California's east boundary line strikes the river and is between three and four miles below the mouth of the Virgin River. The river at this point forms the boundary between Nevada on the north and Arizona on the south. The canyon is narrow, being generally reported as about 250 feet wide for a distance of one-half mile. The sides of the gorge are steep. The rock is granite. The project for storage at this site as now favored by the United States Reclamation Service involves the construction of a dam that would rise to a height of 550 feet above the water surface of the river, forming a reservoir with a storage capacity in excess of 25,000,000 acre-feet. The discharge of Colorado River at this point may be noted, in approximate figures, as ranging from 7,000,000 to 22,000,000 acre-feet per year. The normal annual discharge of the river is about 15,000,000 acre-feet. The water of a full reservoir would extend up the Colorado River into the lower end of the Grand Canyon. A large portion of the storage space would be afforded by the lower valley of the Virgin River. The surface area of the reservoir may reach 125,000 acres from which the loss by evaporation would be about 750,000 acre-feet per annum.

The feasibility of a dam of the dimensions proposed seems now to be generally accepted by the engineers who have investigated the dam site. A reservoir at this point would control the flow of the Colorado except the contributions by the Gila River, and could be so manipulated that it would eliminate the lower river flood menace to the extent that it is due to up river high stages. It would regulate the flow of the river for irrigation purposes and would permit the generation of about 600,000 horsepower. The power thus generated would be available for use at points as far removed as San Francisco, but the principal place of use would naturally be in Arizona, Nevada, southern Utah and southern portions of California.

The up-river use of water for irrigation is increasing. Some small diversions of water from the headwaters of the Colorado River into adjacent drainage basins are already accomplished and others are under contemplation. It is not now known to what extent this up-river use of water will decrease the discharge of the river through the Boulder Canyon and there is consequently some conjecture as to whether the above indicated power output can be realized. In any event there will always be a sufficient flow to make storage worth while, and the natural flow alone to which unassailable down-river rights have already been established by beneficial use would justify the use of the water in generating

power if a dam of any considerable height is placed in Boulder Canyon. It may be noted in this connection that the Yuma project will require a summer flow of 1500 to 1700 second-feet and has been actually using 1100 to 1200 second-feet. Imperial Irrigation District for use on the lands of the district and on a smaller area in Mexico, has been diverting and using over 6000 second-feet in summer and more than one-third of this amount at times of minimum demand in winter. So, too, at Palo Verde there has been diversion and use on a large scale. Plans for extension of irrigation in the lower river regions

Some idea of the extent of the Boulder Canyon reservoir can be gained from this view of the arid valley above the dam which will be entirely filled with the waters of the Colorado.

have been made, notably in the case of Imperial Valley where it is proposed to add some 400,000 acres to the irrigated area. But any such extension of irrigated areas is conditioned on conserving the present wastage of flood waters. This wastage is large as will be seen when the volume of flow reaching Laguna Dam, about 16,000,000 acre-feet per year, is compared with the amount diverted by Yuma Reclamation project and the Imperial Irrigation District together, about 2,500,000 acre-feet.

Another Colorado Flood Imminent

There is another urgent reason, aside from extension of irrigated areas and power development, for the early construction of a big regulating reservoir somewhere not too far up on the Colorado. This is the control of floods. The floods on the lower river have become a serious menace to the river's delta lands. Adequate storage facilities on the river under proper control would reduce the peak of all flood discharges except only those which originate in the watershed of the Gila River. It should be noted, however, in this connection that such storage alone will not completely solve the flood control problem. Colorado River is now running wild in that portion of its delta which lies to the southward of a line about 20 miles south of and roughly parallel with the south boundary of California. Ever since the river abandoned its channel at a point near the south line of Arizona in 1909 it has been flowing westerly from that point and has piled its drift and silt into the Volcano Lake region. The lake has been practically obliterated by silt deposits. In consequence of the increasing obstruction thus placed in the way of flood water the flood plane is rising at the rate of about one foot a year and has now progressed to the point where the river at its high stages will begin again to overtop its natural banks in the 20-mile stretch in which the river forms the boundary between Arizona and Mexico, and its high waters may become a menace to levees whose bases have been barely lapped with water for some years past. This situation demands action which should not be delayed. The United States should take whatever measures are necessary to secure the right from Mexico to put the Colorado River back upon a direct course to the Gulf of California and this should be done at once regardless of whether storage works are constructed or not.

One Hundred Eighty Million Tons of Silt

The silt carried by the river is a factor to be considered in the planning of storage facilities. The river carries in suspension annually about 180,000,000 tons of silt and rolls some more along its bottom. An average of over 100,000 acre-feet of well compacted sediment are brought down to the river delta annually. Perhaps 80,000 to 90,000 acre-feet of deposit in a reservoir at Boulder Canyon should, therefore, be expected. This would, of course, accumulate in the up-stream portions of any reservoir that is at the points where the water loses its silt transporting power. If the Boulder Canyon project is carried out, it would take the silt about 30 years to destroy one-tenth of the proposed storage capacity, consequently deterioration due to the accumulation of silt in the reservoir is not a serious problem from an economic standpoint.

The Advantages of an Upper Dam

As an alternative to the early construction of the Boulder Canyon project a reservoir farther upstream above Lee's Ferry in Glen Canyon has been suggested. Here, too, there is a narrow canyon but

The three rafts of the U. S. Reclamation Service at the site of the proposed Boulder Canyon dam engaged in drilling to determine the rock formation on which the dam will rest.

the walls are sandstone instead of granite. A loose rock dam with an effective height of over 700 feet and a storage capacity of over 40,000,000 acre-feet has been suggested for this site. A reservoir at the Glen Canyon site would be less effective in control-

ling floods, being some 300 miles farther up stream and it would be farther removed from the power market. But a dam at this point would have the particular advantage of so checking and regulating the major portion of the river flow that the construction of other dams farther down stream would be facilitated. Its construction, although perhaps not to the extreme height suggested, would be in line with the ultimate maximum utilization of the river flow because if used in conjunction with a high dam at some down-river point, the water from this upper storage could be liberated at rates adjusted to power requirements without regard to irrigation demands and the regulation for irrigation would be effected entirely at the down-stream reservoir.

Water Enough For All

There are one or two facts which stand out prominently, as for example the apparently slight effect of the increase of the use of water at up-river points upon the amount of water which reaches the Laguna Dam near Yuma. The records of discharge lack the accuracy and fail to go back far enough to make the effect of up-river irrigation of about 1,150,000 acres upon this flow apparent. To what extent then will the addition of perhaps 1,600,000 acres more to this irrigated area reduce the flow? Of the 3,000,000 acre-feet of water required for this area a part only, say 2,000,000 acre-feet, should be subtracted from the down-river discharge. Assuming the minimum yearly supply at Boulder Canyon to be 7,000,000 acre-feet under present conditions and the normal about 13,000,000 acre-feet then without restricting the use of Colorado River water for irrigation in Wyoming, Colorado, Utah, New Mexico, Arizona and Nevada, there will still be 3,000,000 to 9,000,000 acre-feet of water per annum that will go to waste after supplying the present needs of lower river irrigators who now have some 700,000 acres in cultivation.

Storage on a large scale is essential to reduce this waste and to make some of the water of the years of larger flow available in the years of light run-off; but in analyzing the effectiveness of a reservoir for this purpose it must be remembered that if the water released from storage is to serve both for the generation of power and for irrigation, the head at the dam should never be completely sacrificed and that, therefore, the effective reservoir capacity should be entered into a calculation at much less than the full capacities as above noted.

The cost of providing a reservoir at the Boulder Canyon site is generally given at upwards of $30,000,000.

Who Should Build the Dam?

The agency which should carry out the regulation of the flow of the lower river in the interest of irrigation, for the development of power and for flood control should be the United States, but, if private parties are ready to undertake the work subject to such control by federal government and such regulations as may be necessary to properly guard conflicting interests and established rights, there can be no valid objection to granting such private parties permission to proceed with the work.

In no event should the right to control be passed on to the several states which are interested in the conservation and use of the waters of the Colorado River and its tributaries. It is well enough for the Colorado River Commission, which is now functioning with Mr. Herbert C. Hoover at its head, to define the relative interests of these states in the waters of the river, but despite all that any of these states can do in the matter of putting the water to beneficial use, there will still be a surplus to flow down the river into its lower reaches and the works here under discussion will certainly be carried out in some form.

The Boulder Canyon dam site where a monument of concrete and rock will rise to a height of 550 feet, storing 25,000,000 acre-ft. of water, which will irrigate thousands of acres of arid land, protect the Imperial Valley from disastrous floods and generate approximately 600,000 hp. of electrical energy to turn the wheels of countless industries in Arizona, Nevada and California.

If the United States undertakes the work, then suitable provision should be made for wholesaling the water to the districts that are irrigated with water that is made available by storage, a fair charge should be made to the power companies who obtain power from this source for distribution, and annual benefits should be assessed against the regions which are benefited by flood control or, of course, there might be an equivalent immediate or early return to the United States of capital investment which could best be accomplished by issuing bonds and turning the same over to the United States.

Should California Reject the Principle of Utility Regulation?

The Former President of the California State Railroad Commission Defends the Present System of Regulated Service which is Endangered by the Proposed Water and Power Act to be Voted on in November

By E. O. EDGERTON
President, East Bay Water Company

ARE we in California about to do a foolish thing? Are we about to sweep aside all the valuable teachings of experience, to disregard the advice of those intimately familiar with the detailed operation of a great industry and instead, with blind faith, to follow those lacking experience and who, proceeding without regard to facts, seek to establish leadership through appeal to the emotions, prejudices and hopes? Are we to jeopardize the foremost position in America in electrical development and with reckless disregard of consequences abandon a demonstrated success for an untried experiment already bearing evidence of failure? Are we to besmirch the honor and draw into question the good faith of the great state of California by deliberately, and for wholly selfish purposes, jeopardizing the honest investment of thousands of our citizens in the power enterprises?

In short, will the people of California at the coming election in November, by popular vote, adopt the Water-Power amendment to the Constitution?

To one who has a knowledge of the conditions in California surrounding the electric industry it is incredible that the state would interrupt, or in the slightest degree impede, the wonderful development now going forward of the electric resources of this state. Without any exaggeration it may be stated that California leads the country in the production of electricity to consumers under the best service conditions and at the lowest rates, with state regulation which, while it gives all of the benefits and economies of monopoly, protects consumers against oppression.

Today we have all of the benefits of stimulated private initiative with complete control by the state to check and prevent the evils arising from the unlimited play of selfish interests.

For ten years now state regulation of public utility power companies has brought to the point of demonstration these things:

Adequate development of hydroelectric energy with proper steam reserve and standby, the most economical transmission of electric energy brought about by the most highly scientific studies and installation of the highest voltage transmission in the world and the distribution of energy not only in congested thickly populated centers but in the great agricultural areas where consumers are scattered and comparatively few in number. The availability of electric energy to practically every established farm and to thousands of acres awaiting development. The production of electric energy in advance of consumption to an extent unprecedented anywhere.

The absolute elimination through regulation of discrimination as between consumers so that today every consumer within a given class of use has the assurance of identical treatment and the smallest and least influential consumer receives precisely the same treatment as the largest and most influential user. The establishment of absolute equality before the Railroad Commission of all consumers.

The production to the consumer of this wonderful service at actual cost, the only profit derived by those who have in good faith invested their money in these enterprises being a moderate interest return on the money put into the properties. The lowest rate for the best service, favorably contrasting with any state in the Union.

The submission to the impartial and intelligent scrutiny of the Railroad Commission of all stock and bond issues and of every important function of the power companies. The exposition in public hearings before that Commission of every intimate detail of corporate management.

The evolution of the attitude of power company management from one of some reluctance to acquiescence in state regulation and a full realization that in complete and effective regulation lies the safeguard and security of the business.

The elevation of the ideals of management of the power companies to the point where today they stand unrivaled as business organizations, dealing on a basis of higher standards and more concern for the public weal than any other class of business.

The successful working out of complete state control of the great electric industry without the stifling of initiative and ambition on the part of management for constantly better results.

The establishment of confidence in these great public utility enterprises on the part of investors to the extent that today, after ten years of regulation, practically unlimited funds are available on reasonable terms for the development of the business.

The complete demonstration that the most interesting and perhaps most important experiment in government—the state regulation of public utilities—is a success.

The most complete information of every angle of the electric business as a result of intensive and repeated investigations by thoroughly trained men so that each forward step may now be made based upon exact knowledge of conditions that exist.

The demonstration that public officials, undaunted by the clamor of the demagogue and in the face of misinformed and misguided public opinion will honestly and conscientiously carry out sound and intelligent measures to preserve to the people the uninterrupted vital service of electric energy and on the other hand the complete submission to state control of the energetic and able men engaged in operating the electric properties.

Advocates Inadequately Informed

And yet today we are asked to conclude that all of the above accomplishments are worthless or evil, that the electric industry under state regulation is a failure and that we now propose to turn for relief to an untried experiment of state ownership and operation of the electric business and to do this at the behest and in reliance upon men who not only have had no experience in the conduct of great electric enterprises but who did not avail themselves of carefully gathered and recorded data before the preparation of this Water Power Act.

It is an astonishing proposition that men would urge the adoption of a constitutional amendment which authorizes the issuance of state bonds to the extent of five hundred million dollars for the purpose of putting the state into the highly complicated and technical business of producing and distributing electric energy, without the most careful and exhaustive investigation, studies and estimates made by competent men.

Applying Simple Business Principles

No responsible business man in his sober senses would so act. Imagine the president of a power company going before his board of directors and seriously proposing a commitment for hundreds of millions of dollars based on his mere assertion that the enterprise would be profitable because another power company in some other part of the state had made profits. He having made no investigation of the conditions under which these profits were made and being without any knowledge of whether the alleged profits were actually earned or whether the total cost had properly been accounted for. Suppose in response to a question of a director he admitted that the entire basis of his judgment that the proposed commitment was wise was based on statements made by men engaged in the power business upon a very small scale and who naturally would be inclined to assert the success of the enterprise for whose management they were responsible.

Certainly a board of directors which would accept such a proposal would be convicted of the grossest inefficiency and bad judgment and unquestionably there is no board of directors today in California of any power company which would not immediately lose faith in its president if he made such a proposal—and yet this is precisely what the proponents of this Water Power Act have done.

A careful perusal of every public argument and of every statement of fact they have made shows beyond question an utter lack of that careful investigation, that careful assembling of data, that careful weighing of this data upon which sound judgment should be based.

What possible justification is there for the gentlemen who are urging the people of California to commit the state to such a tremendous business enterprise and to blindly follow their leadership when they have utterly failed to base their advocacy upon an investigation such as any reasonable business man would make before committing himself?

It is true that these advocates talk principally of municipal ownership and seek to persuade people that this scheme is one merely to help cities finance comparatively small electric enterprises. But the Act itself in precise terms authorizes the state, through five appointed officials, to enter completely into the power business and for that purpose to expend up to five hundred million dollars.

We who have faith in California, who have a profound respect for its history, for the pioneer men and women who created a character for this commonwealth, a character of rugged honesty and practical Americanism—a willingness to advance and progress but only upon established facts and the exercise of business judgment—we, as I say, who cherish the reputation of a forward-looking and progressive but intelligent and sane people cannot convince ourselves that this radical proposal with all that it means will be adopted and that there will be repudiation and abandonment of the splendid achievements already accomplished.

China is Electrical Machinery Market

Peking Hospital Has Completely Electrified Laundry and Kitchen While Other Institutions are Similarly Equipped

WITH washing at one and a half cents a garment there is but little call for washing machines, or any other strictly labor-saving device, in Chinese homes or the homes of foreign residents in China. However, large institutions such as hospitals, are tending to provide an ever-growing market for electrical installations of all kinds, and the recently-opened plant of the Peking Union Medical College Hospital has a large electrically-equipped laundry with electric washers, wringers, driers and ironers

Americans who are used to the ordinary Chinese laundry are due to receive a shock from the modern clothes washing department of the Peking Union Medical College hospital. This institution also has a completely electrified kitchen as well as its own power plant.

which handle three thousand pieces a day. The spacious kitchens, also, are electrified, having even electric egg-beaters and potato-peelers. The institution has its own power house with a generating capacity of 375 kw. which furnishes light and power and steam heat throughout the buildings, and special low-volt current to the experimental laboratories for use with incubators and other equipment. The buildings are ventilated by means of electrically driven exhaust fans. Nitrous oxide and oxygen are pumped direct from the nitrous oxide plant to the main operating rooms. There are in all 153 electric motors in operation and eleven electric generators.

This particular institution, situated in the capital and richly endowed, is of course not an average one, but mission hospitals far in the interior are continually adding electric light, pumps, and X-ray machines to their equipment. As there is no electrical service in many of these outlying districts, the power is frequently generated by a power-light plant owned by the hospital.

While there is a plentiful fuel supply for such engine driven generating units in the cities near the coast, the extensive use of such units is seriously hampered in the interior by lack of such fuel. However, this problem is rapidly being solved.

Denver Proves Illumination is Asset to Civic Beauty

Intermountain City Attains National Fame for Striking Effects Achieved Through Scientific Application of Lighting Principles to Streets and Buildings by Denver Gas and Electric Light Company

Denver's Civic Center is one of the most artistically lighted parks in the country. Indirect and flood lighting have been used to good effect to bring out the beauty of the Cheesman Memorial at night.

The Denver Gas and Electric Light Company has played a prominent part in the spread of the doctrine of illumination as one of the great assets to civic beauty.

A panoramic view of the city from the West Portico of the Capitol Building shows the brightly lighted Gas and Electric building in the center of the business district.

In few fields has the electric sign had greater application than among the theaters. Curtis Street in Denver, better known as "Movie Row," is an example of a small "Great White Way."

The Voorhies' Memorial in the Civic Center is a striking example of flood lighting as applied to public buildings.

The Denver Gas and Electric Light Company has set a high standard with the illumination scheme adopted for its building.

The new Colorado Theater has the appearance of being flood lighted whereas the effect is derived from the two signs alone.

Self Improvement in Salesmanship

A University Study Course for the Man who Meets the Public in Every Line of Business

By WILLIAM A. RUSSELL
Professor of Sales Management and Advertising, University of Washington

THE BUYER OF THE GOODS

At the outset of this series of articles on practical salesmanship we found that we had to consider our problem from four specific angles, so now, having discussed the salesman himself, and the goods he is offering for sale, we have to shift our attention to the prospective and potential buyer of our goods.

One of the best definitions of salesmanship which I have ever heard is this: "Salesmanship is the art of persuading people who need certain goods, to purchase them, and this by using means and methods which consume the least time and effort."

The time is not so long past when practical men on hearing the word "psychology" mentioned with reference to their work would get insulted and would denounce the speaker or writer for a hair-brained theorist. At the present moment the use of this word requires either explanation or apology no longer. The fact has become universally recognized that selling is an out-and-out psychological process.

The first psychological factor of a sale to which I want to call your attention lies hidden in the words "people who need certain goods" used in the first part of the definition of salesmanship I just gave.

The Various Kinds of Demand

To buy an article a man must have simultaneously two things, the desire for this article and the means to purchase it. Lacking either one of the two the man cannot or will not buy this article. Having both he will or can buy it, and in this case we speak of "effective demand." Such a case will be illustrated by my wife going to a department store and, having enough money in her purse, requesting the young lady at the counter to give her a spool of No. 50 white cotton thread. Little salesmanship is needed to sell in this instance.

But now, take the case of a woman on whom you call to sell a washing machine. She may know and like your machine from having seen it at the home of some good friend of hers, but she honestly believes that she cannot afford its price. This kind of demand we call the "ineffective demand," and here salesmanship has to step in to raise the intensity of her desire to such a level that she will find a way to "afford" the price of the machine. This the salesman will attempt to do by using the various tools of appealing, persuading and convincing, with the purpose of so affecting her by his psychological appeals that her own instincts will make her place a much higher personal value than ever before on that washing machine.

And, third, there is the case of the so-called "latent demand," the case where a person equipped with sufficient purchasing power does not buy simply because he or she is not aware of the advantages offered in this specific instance, and to him or her personally, by the given article. The task of bringing such "latent demand" to the surface by education and propaganda among people who "should buy but do not" is nowadays mostly accomplished by the various advertising methods used in modern commerce. Nevertheless personal salesmanship in many lines, particularly so in the electrical field, is deeply concerned with the conversion of the latent into effective demand through so-called "educational salesmanship."

In all these three classes of "demand" the problem which presents itself to the salesman is a purely psychological one of either awakening the non-existent desire, or of so intensifying the insufficiently strong initial desire of the possible purchaser as to induce him to convert mere wish into action.

And, after all, this is really the heart of the salesmanship problem. All the other factors we have been discussing until now were really more in the nature of preliminaries.

Stimulating the Desire

There are several angles from which we have to consider the problem of "persuading people by means and methods which consume the least time and effort."

By what means or methods can we influence people so as to change the intensity of their desire or, in the case of "latent demand," to awaken this desire to begin with?

Second, upon what elements in the personal make-up of people do their desires depend and what factors in our individual psychology control the intensity of our wishes and desires?

And third, what are the various social and individual types of buyers with whom we have to deal, and how does this affect the problem of stimulating or awakening their desire for our product?

The Two Methods of Influencing

There are in use among people in general two widely different methods of transferring thoughts and ideas. We influence people by reasoning with them and convincing them, and on the other hand we influence people by appealing to their instincts and feelings and by suggesting things or actions to them.

The tools of influencing are very different in both cases, and in fact, not everybody can handle

the two sets of tools for thought transfer equally well. The clear, crisp, reliable logician and the suggestive novelist or poet both succeed in transferring their thoughts to us and in influencing our ideas and desires. But it is very rare indeed that the logician can use the methods of the poet or the poet the methods of the logician.

The salesman, though, is supposed to use either method as occasion may demand, and in the measure as he succeeds in acquiring both techniques he will find that his influence on people as a whole becomes more and more effective because then, like a skilled worker, he is at liberty to choose exactly the tool that suits the occasion, instead of being forced to use his single tool under favorable and unfavorable conditions.

Reasoning and Convincing

Used as an exclusive method, reasoning in the sense of logical marshalling of proofs can be applied only in those cases where we deal with highly skilled professional buyers. With unskilled buyers it serves only in an auxiliary capacity.

Reasoning, in its simplest form, implies the use of two proven sets of facts, called premises, the first of which is broad and inclusive and the second narrow and specific, from which a third statement can be drawn forming the conclusion from the two premises.

In actual practice we do not always follow this somewhat stilted form of reasoning, but shorten it by dropping out one or both premises on the tacit assumption that they are too well known to require a restatement at this moment. So we say, in reasoning, "Some day John is going to die." And we are hardly conscious that we simply neglected to state the following two implied premises: (1) Experience has proven that all human beings are mortal; (2) John is a human being; and have gone on to state the conclusion: (3) Therefore John is mortal.

Notwithstanding the apparent simplicity of this process of logical thinking most of the reasoning of people proves faulty, and this for two reasons, first, we frequently assume as proven premises whose truth has not really been demonstrated beyond any doubt; and second, the apparently simple form of conclusion given above is not quite as simple as it looks, as can be seen from the following triple sentence seemingly built up on the same principle: (1) Most trees have green leaves; (2) Our apple tree has green leaves; (3) Therefore most trees are apple trees.

As a practical conclusion it would seem to follow, hard as it is for the busy practical salesman to admit, that if we really want to master the art of convincing with reference to the goods we are trying to sell there are two things which we unavoidably must master. We must learn the true facts with reference to our product, its qualities, performances, uses and advantages. And we must learn at least the rudiments of correct reasoning by studying the principles of the so-called science of logic.

Whenever your buyers are highly trained professional specialists these two things just mentioned must inevitably form part of your selling equipment, as you can see from the fact that the large electrical manufacturers use trained engineers as salesmen.

But when you sell to the general non-specialized buyers, to the public at large, the straight reasoning method is not really the most effective means of influencing people's desires, because, so psychologists tell us, the motives which impel people to act are not really based on their reasoning but are a consequence of their instincts, customs and habits. And it is these forces which we have to utilize when we deal with the untrained buyer.

Appealing and Visualizing

The next article of this series will be devoted to a discussion of the motives of people in general. Here we must merely recognize that these motives have to be reached by the one open route to the intimate and often unconscious processes of instinct and feeling, the so-called "short-circuit" method of direct appeal through association of ideas and through "suggestion." And the path in the buyer's mind, by which we may open up the active flow of his desires, is usually referred to as his "imagination."

The practical deduction for the salesman who wants to use these powerful assistants discovered for him by the psychologist, who wants to let his goods participate in or benefit by the pleasant feelings which are awakened in people by a number of images familiar to them, is that he has to school himself in both the ability to discover the various "associations" attaching to things and ideas, and the ability to bring about the appearance of these images together with their feeling-colors in the minds of his clients.

There are no set rules and prescriptions which would help anybody to acquire these abilities, so I am able only to throw out a suggestion which, I know, will appear far-fetched and tedious to the majority of my readers. But what does the proverb say? "There is no royal road to knowledge."

Read Good Authors

The best, if not the only way to study the successful methods of appealing to people's imaginations is to watch how people notoriously successful in that line have been doing it and are doing it.

You can go and listen to successful speakers. And when you cannot do that you surely can go to the library and borrow books written by masters of the art of human appeal. And do not think that I am recommending to you the reading only of classical literature. Far from it. I speak of modern good writers. Do not ask me to quote names, because I am not a specialist in English modern literature. One thing is sure, if some author enjoys a good reputation; if his or her stories and articles are printed by our best publishers and continue in popularity for a fair period of time, you can be assured that by studying their methods of appealing to their readers' imaginations you can learn a great number of technical points on the best ways of appealing to the imaginations of your public—the customers to whom you want to sell your goods.

Increasing Production in Industry

Shortcuts in Management and New Power Applications That Have Reduced the Cost of Manufacturing Processes or Increased the Rate of Production. Ideas and Suggestions by Practical Men.

Auto-Electrolysis as a Possible Cause of Mechanical Failures

By R. C. CHERRY
Asst. Prof. Elect. Engr., University of California

Having noted many articles and many inquiries in electrical magazines within the last months regarding electrolysis, the writer would like to make a report on some observations and recent experiments, and through this elementary report suggest a field of wonderfully practical possibilities.

This research originated some five years ago when in one of the large hydroelectric power plants of the United States Reclamation Service some 200 bearings in the governing system of the water wheels were destroyed past use in less than one year of actual service.

These bearings consisted of hardened steel pins oscillating through a small angle in a plugged bronze bushing and were supposed to be self-lubricating in a spray of water. The motion was not sufficient to overlap the plugs in the bushing and at the end of 245 days of actual use the pins had the appearance shown in Fig. 1. Pins three inches in diameter were reduced one-eighth of an inch.

As an experiment the soft plugs were removed from one of the bushings, the steel pin and the bronze bushing were placed in distilled water and an initial potential of 0.3 volts positive from the steel to the bronze was observed. This potential, however, was increasing rapidly, depending upon quantity of water

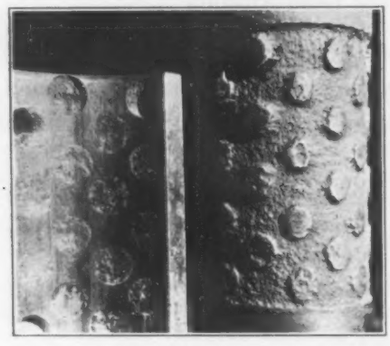


Fig. 1

A bronze water wheel bushing showing the effects of electrolysis after 245 days of use. Two hundred bearings were similarly affected.

used and metal surface exposed, until over 0.7 volts was obtained. When, in like manner, the plugs from the bushings were tested to the steel a potential nearly equal to that obtained with the bronze was noted, but positive from the plugs to the steel. Thus as indicated in

THIS DEPARTMENT

will be devoted to a discussion of practical problems of industrial operation and management. Readers' requests for information will be published in each issue, together with the answers to previous questions. It is hoped that readers will take full advantage of this opportunity to profit by the practical experience of others and to give others the benefit of their own discoveries. Space rates will be paid for answers which are published.

Fig. 2 we find two potentials in series sending current through a circuit consisting of a short path through the steel, the bronze bushing and the plugs, and two films of alkaline water. This current doubtless carried that steel

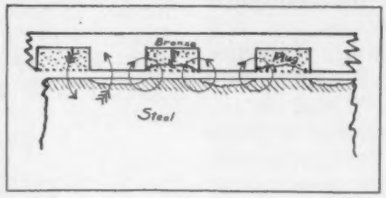


Fig. 2

Diagram showing the direction of potential when a bronze bushing and a piece of steel shafting were submerged in a distilled water electrolyte.

which was opposite the bronze into solution while that which was opposite the plugs was absolutely protected.

Following are a few of many observations of similar action which have been brought to the attention of the writer.

Fig. 3 shows the cross-section of a pipe taken from the chemistry laboratory at the University of California which failed at the point shown after only a few months' use. The pipe was lined with tin and was used to carry distilled water. There was apparently a flaw in the tin lining, and iron being decidedly positive to tin, a current was immediately set up from the exposed iron to the tin, eating out the cavity in the iron as shown until the pipe was eaten through from the inside.

In another instance a large number of steel stud bolts were used to hold bronze stuffing glands on some large valve stems, all being submerged in water in the penstock of a power plant. In about one year's time these bolts, where they passed through the bronze gland, were completely eaten off, dropping the glands.

The steel shaft of a 300-hp. centrifugal pump passed through a bronze bushing between the rotor of the pump and the stuffing gland. In about one year the shaft was destroyed beyond use where it passed through the bushing and had to be replaced. A bronze bushing of sufficient size not being available, in the emergency a babbitt one was substituted and after some three years' use both the shaft and the bushing were found in excellent condition. Why? That particular babbitt must have been approximately neutral to that particular steel.

There is a multitude of evidence that this inherent potential between elements and through that potential the "Auto-Electrolysis"—if you will allow that term—of those elements, is a vital factor in machine design.

Take the case of bearings that are lubricated with water as one indication.

In the old steel rolling mills, the rolls on account of the heat were lubricated with water and it was early discovered that the most satisfactory bearing was iron on iron. Why? No inherent potential across the bearing.

The thrust bearings of turbine wheels, the stern propeller shaft bearings of ships and many other water lubricated bearings are metal on wood. Why? A non-conductor for one element of the bearing.

Thus, after several years of observation and discussion with designing and operating engineers of wide experience, we believe that this idea of electrolysis is the secret of many mysterious failures and many successes, such as fiber and rawhide gears, the success of which

Fig. 3

A piece of steel pipe lined with tin which was used to carry distilled water, showing the effects of electrolysis after but a few months in service.

is evidence that this action is taking place even in the dry state; the success or failure of various paints and protective coatings for exposed metal surfaces, and so on through an almost infinite list down to the success of the jeweled bearing in a watch.

Western Dealer, Jobber and Agent

Business building suggestions for the store — Distribution and warehousing methods — Advertising and sales promotion ideas

The Show Exhibit versus the Real Electric Home

Electrical Service League of British Columbia Finds Exhibit Highly Successful in Putting Over Outlet Message

An electrical home exhibit lasting two weeks has recently been held, under the auspices of the Electrical Service League of British Columbia, in connection with a Building and House Furnishing Exhibition, which was promoted by the Vancouver Association of Contractors and Master Builders.

The various branches of the electrical industry pooled their funds to finance the exhibit, which consisted of three rooms of an electrical home in miniature—kitchen, dining room and bedroom.

Particular attention was given to proper illumination and proper wiring for convenience outlets. The B. C. Electric Railway Company, Ltd., Canadian General Electric, Ltd., Canadian Westinghouse Company, Ltd., Northern Electric Company, Ltd., and Horsman and Son (wholesalers) and the Vancouver Association of Electrical Contractors and Dealers sunk the identity of the individual firms in this particular exhibit and no one maintained a separate exhibit. This presented the electrical industry as a single unit to the building public. Under the circumstances, it was necessary in fairness to all the manufacturers and manufacturers' agents financing the exhibit, to determine by lot the particular appliance of each type to be used in the exhibit.

After the lots were drawn each manufacturer carefully covered all marks of identification possible on the appliance he furnished the exhibit. For example, the B. C. Electric Railway Company supplied the range. A placard bearing the legend "Electric Range" covered all name plates carrying the manufacturer's name.

The three rooms of the exhibit were finished and furnished in as attractive a style as possible commensurate with the buying power of the average man's purse. Great care was taken in the selection of furniture, draperies, and other non-electrical fittings. Each room of the exhibit opened on one side and on the opposite side was a large window looking out apparently on the countryside. Skilfully painted and illuminated "backgrounds" were built by a theatrical scenic artist to maintain the illusion that the spectators were in a room in an actual house looking out of doors on natural scenery.

Every convenience outlet was placarded. Those outlets which were installed waist high, or higher in the walls, carried a card directly above the outlet showing its use. Cards on the walls with ribbons running to the baseboard outlets explained their use and purpose so that no doubt was left in the mind of the spectator as to the purpose of the exhibit.

Illuminated street numbers on the outside pillars of the booths attracted considerable attention.

The cost of operation of each appliance was set forth on small cards placed near each particular appliance so that when the demonstrator was busy the spectator could read for himself the cost of operation of any particular appliance.

No prices were quoted by any of the demonstrators, except in a general way; for example, if a customer asked the price of an electric range he was told that ranges vary in price from $90.00 to $300.00 and specific prices and particulars could be obtained from any legitimate contractor-dealer.

Great stress was laid upon proper illumination of the home and it was explained by the demonstrators that fixtures were no longer "just lights" but today form an essential part of the decorative scheme of the home.

The show ran from 11 o'clock in the morning until 11 o'clock at night for a period of two weeks and it was necessary to employ one man to serve from 11 o'clock in the morning until 2 o'clock in the afternoon and to put the exhibit in proper condition each day. From 2 o'clock in the afternoon until 11 o'clock at night two shifts of three men each handled the booth. These demonstrators were furnished equally by the manufacturers, power company and contractor-dealers represented so that a competent person was always in each room of the exhibit to explain proper wiring and proper illumination, as well as the use of appliances.

By using the representatives of the various companies who contributed to the financial support of the exhibit more interest and support was created within the trade than would have been if paid demonstrators had been employed during the exhibition.

During the exhibition 10,000 pamphlets showing the proper wiring plan for a two-story house, with list of suggested appliances and proper convenience outlets, as well as a short article on the value of proper wiring by competent contractor-dealers, were distributed.

A large number of prospects for ranges and sundry small appliances, prospects for wiring for convenience outlets, and prospects for proper illumination were obtained. The names and addresses of these prospects were turned in to the office of the Service League on cards and a personal letter was written to each person asking for information giving the information desired whenever possible. When the prospect wished information on illumination the illumination engineer of the B. C. Electric Railway Company was sent to interview him after the prospect had been advised by letter that on such and such a date, if convenient for him, the engineer would call and give him the benefit of his experience in home illumination, at no cost.

The central station made no effort to sell either fixtures or wiring, but rendered to prospective customers for energy a very real service.

Range prospects were pooled and given to the manufacturers all at the same time, while prospects for particular appliances were turned over to the manufacturer making the particular appliance after adequate information had been forwarded to the prospect from the office of the Service League.

The electrical home exhibit attracted more attention than any other exhibit in the building and in the opinion of the Advisory Council of the Electrical Service League was a success in every way.

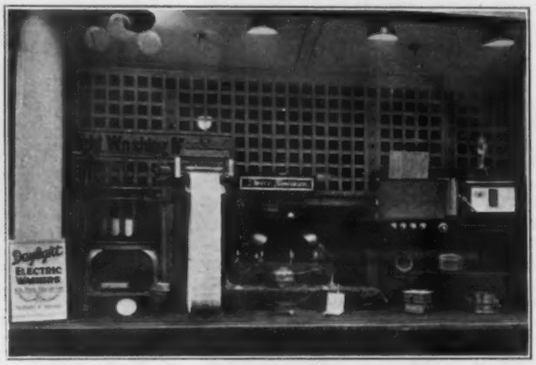
The three-room electrical home exhibit staged by the British Columbia Electrical Service League in conjunction with a "Building and House Furnishing Exhibition" held in Vancouver recently.

Pacific Northwest Has Progressive Contractor-Dealers

Electragists of Portland, Seattle and Spokane Display Marked Ability in Decorating Windows For the Purpose of Calling the Public Attention to Electrical Merchandise

Eleven years ago E. W. Murray, owner of the E. W. Murray Lighting Company, Spokane, started in business with a little shop on a back street. Today he has one of the most attractive and best equipped stores in the Northwest, covering two floors and extending the breadth of a city block. He bases his success on the continual study and use of better merchandising methods.

There is not a single item in the electrical appliance line which cannot be purchased from the Lushington Electric Company of Seattle, which has as its motto, "Better Service."



Window displays which will sell goods are one of the achievements of the Pierce-Tomlinson Electric Company of Portland, which offers this example as proof of its contention.

Humor can occasionally be applied to a window display without detracting from its effectiveness, as the window of the Electric Appliance Company of Seattle shows. Two well known cartoon characters are used to enhance possibilities of a vacuum cleaner.

Simplicity and good taste have been effectively used in the decoration of this small window by the Poole Electric Company of Seattle. There is no question but what this window carries a greater message than one filled with small appliances.

Speeding Up the Sale of Household Appliances

A Discussion of Some of the Methods Used by Electrical Dealers in Southern California to Increase the Volume of Sales

By CHARLES A. GOODARD

Various and sundry chroniclers have stoutly maintained that "there is nothing new under the sun" but to the enterprising contractor-dealer the quotation means nothing. New merchandising ideas, new methods of interesting the public in the goods to be sold and new schemes to increase sales are constantly being devised. Southern California offers a fertile field for the electragist who is in search of new ideas, for in that section of the West the electrical contractor-dealer has developed into a merchandising expert.

In order to speed up the sales of a certain washer, the A. M. Smith Company of Los Angeles invested in a stock of dinner ware which it offered to early purchasers of the washing machine. Considerable advertising was done calling attention to the offer which was made to the first hundred buyers. Each day the advertising was changed indicating the number of sets which remained to be given away. The one hundred washing machines were sold in a record time due to the added incentive of receiving a simple set of dinner ware.

By getting the cooperation of the children a dealer in one community secured a large list of prospects. Children were invited to come to the store late in the fall to witness the operation of a miniature model of a washer. It was built along the lines of the regular machine except that it was a toy, suited for doll clothes. As a window feature it was a success, for with dolls about in the various stages of doing the washing, the story was complete.

At one side set in a stage to represent a kitchen, with its range, miniature kitchen cabinet and other "scenery," was a doll using the miniature washer, her doll clothes hanging on a line. Opposite was another doll bent over a tub. A card on the second setting read:

"I WISH I HAD ONE OF THOSE ELECTRIC WASHERS! IT'S A SNAP TO DO THE WASHING WITH THEM."

A card beside the doll with the miniature washer read:

"NO TROUBLE AT ALL TO DO THE WASHING. WITH THE WASHING ON THE LINE I CAN GO VISITING ON MONDAY."

During the time when canning is at its height a store that handles a wide variety of high grade electrical devices holds a demonstration in its basement. Here there is plenty of room and here there is a model electrical kitchen fitted up with everything electrical, from iron to range. The demonstrator talks to the women assembled about the proper methods of preserving fruits and vegetables and incidentally refers to certain items of the electrical equipment. A salesman for the store precedes her with a brief talk in which he explains not only the functions of the various equipment, but the cost of operation, the terms on which they are sold and the strong points of his particular make. He invites any of them to try out the devices. The magnet that helps to draw women is the refreshments served after the talk, during which the women inspect the various devices and ask questions. It means many prospects.

A customer on the books is worth two dozen on the prospect list; so figures one dealer. His business is largely installment, and it is his pride that his sales per customer are not beaten by any in his city. This is due to his treatment of customers who are paying for their devices.

When the bookkeeper sees that only one more payment is to be made, as she enters the present installment, she makes out a card and turns it in to hte manager. The plan goes back to the sale of the article being paid for. When the salesman sells the party, say, a vacuum sweeper, he asks questions:

"What other electric equipment have you, Mrs. Wyeth?"

"Nothing but an iron," she says.

"It's great to save labor, isn't it?" he hints.

"Yes, indeed it is!" she agrees. "I'd like to have the house full of it—wish we could put in a washer. Can't now."

Thus when he makes out the order for this party the salesman runs down to a square in the lower corner which says: "Equipment Now Used." Under this head he jots down, "Vac. and iron. Wants washer."

Thus the card which comes to the manager shows that the party will soon be paid out; that she has but a limited equipment and that her payments have been paid right on time. He starts action to keep that name on his books. He has his stenographer send a certain letter to the customer in which he says:

Dear Mrs. Wyeth:

I wish to thank you for the prompt manner in which you have handled the account for the vacuum sweeper which we sold you on April 5. By paying for a household device in this manner it is possible to secure one labor-saving device after another and not have to make any big payment while doing so. Your businesslike way of paying this account is appreciated by us.

If you wish, you may select another device and without initial payment go right along paying for it as you have for the vacuum. We are glad to grant you this privilege.

Mr. Sanders tells me that when you selected the vacuum you were in need of a washer. I want you to come in to see our new —— Electric Washer. We consider it a wonder. You have seen from your use of the vacuum what electrical equipment will mean to you in saving work. Let me assure you that the washer will save even more work. It removes all of the hard work from a washing, and enables you to finish early in the day—think of that!

Thus this party is slated as a prospect and a salesman sees that she either comes to the store, or that a machine goes to her home to demonstrate. Another customer will be in need of still another piece of labor-saving device and will be written along the same line, but with proper insertions.

Advertising Appliances with the Help of the Church

"Why not make waffles here, bring in some maple syrup, and sell them, too?" suggested F. S. Henderson, local manager at Boulder, Colo., of the Western Light and Power Company, when the Golden Circle of the local Presbyterian church came to him to get permission to hold a cooked food sale at the company's store and offices. The idea looked good to the church ladies.

It happened that the demonstrator of an electric range was at the Western Light and Power Company at the time. This demonstrator gave her cooperation.

Consequently, in addition to the cakes and other food commonly brought in by the ladies and sold at food sales, there were special and very successful "electrical" features. There were ham sandwiches — the ham being electrically roasted. There were electrically baked biscuits, served hot, with butter and jelly. Besides the waffles and the maple syrup—four or five waffle irons were kept busy—there was electrically prepared coffee.

The ladies washed the dishes in an electric dishwasher.

There were 300 visitors at the sale, which started at 11 a.m. on a Saturday and concluded, all goods sold, about the middle of the afternoon.

News of the success of this food sale, with its electrical features, got out, with the result that the local Episcopal church asked permission to hold a food sale the following Saturday. At this sale, electrically baked doughnuts, biscuits, and a ham were popular articles. This sale cleared about $100.

The Western Light and Power Company's place of business is not on Boulder's main street, but on a side street. These two sales were held early in the month, when an added advantage would be derived from the many people paying their light bills to avail themselves of the discount. Mr. Henderson, personally, is somewhat doubtful of a food sale held at the store later on in the month. However, "electrical" food sales have caught on so quickly in Boulder that other organizations have asked to hold an "electrical" sale later in the season.

Boulder will probably develop effective methods for such sales. Electrical stores all over the West should encourage these electrical food sales, and they will find that advertising possibilities are unusually attractive. For example, in the making of the waffles, the obvious opportunity is to pick out an attractive young lady, and let her make waffles in the window, in full view of passers-by. Along with the demonstration, a sign in the window, explaining the event and encouraging passers to enter, would pull well, especially on the main streets where so many electrical stores are located.

Because the electrical store finds it easier to make room for a cooked food sale than the grocery store, the hardware store, the drygoods store, and most others, it promises to be sought out by church organizations and asked for the use of a window and floor space for several hours. When such requests come, and the electrical dealer will encourage them, it is a simple matter to sell the ladies on the opportunity to make more money by serving waffles and maple syrup, doughnuts, coffee, etc. The electric dishwasher, for handling the dishes, can be mentioned. The experience of Boulder church ladies can be cited.

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers—Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

Columbia Basin Report Filed

Gen. Goethals Recommends Project Be Financed with Government Funds

Favoring the Pend d'Oreille diversion system over the Columbia River gravity system and recommending that the entire Columbia Basin project be financed by the federal government, General George W. Goethals has filed with Dan A. Scott, Washington director of conservation and development, a voluminous report covering his findings with regard to the proposed irrigation project for the Columbia Basin.

The conclusions expressed by the noted engineer regarding the entire project follow:

1—Of more than 3,000,000 acres of land embraced within the Columbia Basin, lying between the Columbia and Snake Rivers, 1,750,000 are irrigable by the Pend d'Oreille gravity project and 1,403,000 by the Columbia River pumping project.

2—The gravity project provides water by gravity flow from the Pend d'Oreille River and its tributaries above Newport.

3—The pumping project provides water from the Columbia River. A pool is formed by a dam, varying from 200 to 285 feet in height, with respective effective heads of 123 to 211 feeet across the gorge of the Columbia at the head of the Grand Coulee, from which water is pumped by hydroelectirc units, each lifting 1,000 second feet approximately 482 feet, or by direct connected units of equal capacity lifting approximately 450 feet, to an artificial lake, whence the water is carried to the land by gravity.

4—The estimated cost of the gravity project is $254,170,351, or $145.56 an acre.

5—The construction is feasible and offers no unusual difficulties.

6—The cost of operation and maintenance for the gravity project is estimated at $841,450, or 48 cents an acre per annum.

7—The lowest estimated cost for the pumping project is $223,096,943 or $159.01 an acre. The difficulties attending the construction are unusual and the pumps proposed have never been built.

8—The cost of operation and maintenance for the pumping project is estimated from $2,610,275 to $2,192,605 per annum, or from $1.86 to $1.51 an acre, depending upon the height of dam adopted.

9—The gravity plan is recommended for adoption.

10—It is recommended that the entire project be undertaken with a view to completing it in its entirety rather than attempting it piecemeal or adopting temporary construction.

11—The estimated time for completion is six years.

12—The soils of the irrigable lands are fertile and abundant, being in all respects similar to Yakima and Wenatchee Valleys; large production will result from water on the lands.

13—A great variety of crops can be produced, and, due to the excellent transportation facilities, can be carried to the markets of the world.

14—No apprehension need be felt about settlement of the lands after water has been placed thereon.

15—All things considered, the project is justified from an economic standpoint if the land can be made ready for planting at a cost ranging from $200 to $275 an acre; at the latter price a profitable return will be secured on the investment.

16—The project, because of the benefits that will accrue to the United States as a whole, is a national one, and as such should be carried out by the federal government through direct appropriation.

17—Following the existing policy of the government in its irrigation projects, the farmer or land holder should be taxed to amortize the cost of construction. The government should bear or absorb the interest charges, which will be more than repaid through the increase that will result to the natural wealth, affecting industries and products of all kinds over the entire country.

Tacoma Will Build $300,000 Steam Generating Station

To guarantee the city adequate electrical power next winter, the city council of Tacoma at a recent meeting instructed the city lighting department to construct this summer a steam generating electric plant to operate from steam purchased from the Consumers' Central Heating Company. The plant will produce a maximum of 9,000 kw. The action taken, which will involve expenditure of $300,000, is considered one of the most important the council has passed upon in several years.

The cost of the steam generating plant will be paid from the earnings of the light department, without issuance of bonds. Immediate steps will be taken to get bids on turbo-generators, boilers and a building to house the equipment, which will be constructed on city property, adjoining the plant of the Consumers' Central Heating Company on Dick Street. Every effort will be made to rush the construction work. The price to be paid for steam to be furnished by the Consumers Central Heating Company, whose prime business is the heating of down-town buildings, is approximately .8 cents per kilowatt-hour, for the maximum price, while a sliding scale of discounts brings the minimum to .56 cents. The city now pays the Tacoma Railway and Power Company .8 cents per kilowatt-hour for steam-generated current, and .66 cents for water generated power.

Seattle Makes 25% Reduction on Off-peak Industrial Power

Industry in Seattle is assured a healthy growth as the result of an ordinance making a 25 per cent reduction in the rate charged for off-peak industrial power, which has been passed by the city council. The new measure provides that "for current used for industrial power purposes the rate for peak hours shall be the same as for commercial purposes, and for off-peak hours the rate shall be 25 per cent less on all loads of twenty-one horsepower or over. The peak-load hours shall be between 4:30 p.m. and 9:30 p.m. For the purposes of enabling the city light department to carry out the provisions hereof, in all loads of 100 horsepower or over the consumer shall furnish and maintain a graphic recording watt meter."

Railroads Spending Millions

Union Pacific Starts Program of Betterments in Southern California

Much of the $29,000,000 appropriated by the Union Pacific Railroad for new equipment, short line extensions and improvements during 1922 will be spent in Southern California, according to an announcement made by C. P. Smith, assistant to the general manager of the railroad.

Work will be begun immediately on extending the Santa Ana line from Whittier to Anaheim at a cost of approximately $2,000,000. The branch will open up a large and rich agricultural territory. The contract for this work has already been let to the Utah Construction Company.

The Los Angeles freight terminal, which is being built at a cost of $900,000, will be completed before the end of the summer. A contract has already been let for the construction of a $200,000 terminal at Long Beach in the flood control district, while plans are under way for the construction of a freight cut-off from this terminal in Long Beach to East San Pedro which will eliminate freight traffic along the congested Long Beach water front.

Of the total sum to be expended this year by the railroad company, $9,200,000 is to be spent for new equipment, much of which will be allotted to Southern California, according to officials. New cars form the bulk of the equipment to be purchased.

Utah Power Company Seeks Permit for Large Development

One of the largest water filings made in southern Utah for several years has been made by the Utah Power and Light Company of Salt Lake City, in an application to the Utah state engineer for the use of 5,000 second-feet from the direct flow of the Green River, and also for the storage of 150,000 acre-feet, for the purpose of furnishing power to various points in Utah.

A cement concrete dam 250 feet high and 900 feet long is mentioned in the application as the diverting works. The power house will be constructed in the dam, according to the plans, and therefore no pipe line would be necessary.

Seattle's first radio show, which had been set for the last week in April, has been postponed to either the week of May 22-28 or the week of May 29 to June 3, the change being made at the request of the two big exhibitors who plan to have extensive exhibits, the Radio Corporation of America and Westinghouse Electric and Manufacturing Company.

Events in Washington of Interest to Western Men

A Survey of Recent Developments in the Nation's Capital by Paul Wooton, Special Correspondent of the Journal of Electricity and Western Industry

Officials in Washington who have looked over the record of the public hearings conducted by the Colorado River Commission in the West are not as sanguine as Secretary Hoover as to the possibility of negotiating a peace treaty between the states of the Colorado basin and securing its ratification by the legislatures of the states and by the Federal Congress. In the opinion of one official at least, there was more discussion of states' rights at these hearings than there was during the ten years preceding the Civil War. With the people in the frame of mind as is indicated by the utterances of their representatives at these hearings, many officials fear that the solution of the problem will have to be passed on to the next generation.

There is a general tendency to commend the appointment of the Commission composed of engineers. After fifty years of litigation, it is admitted generally that the lawyers made a mess of the proposition in which they were assisted in no small degree by the courts, which after all these years have handed down no clear-cut, fundamental decision.

While there is a tendency in official circles to be pessimistic as to the outcome of the present effort to solve the problem, there is no official in Washington connected with reclamation, water power, river hydraulics, or flood-control who does not hope against hope that some prompt plan may be worked out whereby the Colorado may be used to its full value. In a country where water is worth more than land, it is much more lamentable, they say, that a great development like this should be held up for lack of concord than in a proposition like Muscle Shoals, where the development of the surrounding country does not depend absolutely on the utilization of the river's possibilities. In the case of the Colorado where the development of 4,500,000 acres and 6,000,000 hp.—basic resources sufficient to support 67,000,000 people—are in the balance, it is the more regrettable that it is impossible to get the project out of the conversational stage.

The East is only beginning to realize the potentialities of the Colorado. Even yet it is not known generally that the Colorado at times has as great a flow of water as has the Mississippi at St. Louis. Even with its great flow, they do not realize that it would take the entire flow for two years to fill one of the reservoirs that is being planned. There is also the obligation of the nation to the people of the lower Colorado who have been fighting its waters since 1849. They are entitled to Federal aid in the matter of flood-control. The precedent was set several years ago when Congress enacted the flood-control act which made possible the material strengthening of the levee lines along the lower Mississippi. Incidentally, had Congress not taken that action, practically the whole lower Mississippi Valley now would be under water in the face of the combined outpourings of every tributary of the Mississippi, which, for the first time since records have been kept, are in flood at the same time.

Power Permits Issued

One of the most important licenses which has been issued recently by the Federal Power Commission is that granted to the Southern California Edison Company, covering its $13,000,000 project on the San Joaquin River in Fresno and Madera counties, California. The primary power available is 112,000 hp. The six large turbines which are to be installed will be capable of developing 195,000 hp. The project works include a concrete arch dam 100 feet high, and a tunnel 21 feet by 21 feet which will be 28,000 feet long. There will be two parallel 220,000-volt transmission lines, one and one-half miles long to a 20,000-kw. power house. This license does not cover an important part of the project which is the construction of a large reservoir on the headwaters of Oak Grove Creek. It will be extended to include that part of the project once the state regulations have been complied with. A preliminary permit was issued in connection with the license to cover a reservoir on the Clackimas River from which water will be diverted into the intake on Oak Grove Creek.

The Southern Sierras Power Company, of Riverside, has been granted a license to cover two developments on Snow Creek and its tributaries in Riverside county, California. The project works in one case include three miles of 18-inch conduit, and a two thousand-kva. power house operating under a head of 868 feet. The power to be developed at these new plants is needed to augment the supply now being furnished to the San Bernardino and Imperial valleys.

A license also has been granted to the Southern California Edison Company covering that part of its proposed power project on the Kaweah River, lying outside the Sequoia National Park. The entire project was covered by the permits granted to the Mount Whitney Power Company by the Department of the Interior and by the Department of Agriculture. The Interior Department's permit covered that part of the project lying within the National Park.

The Southern California Edison Company purchased the rights of the Mount Whitney Power Company and applied to the two Departments for a transfer of the permit. This transfer was approved by the Department of the Interior in August, 1920, but the Secretary of Agriculture declined to approve the transfer granted by his Department on the ground that the passage of the Federal Water Power Act rendered him without authority to act in such a case. The matter was referred to the Attorney General who rendered an opinion to the effect that the matter now comes under the jurisdiction of the Federal Power Commission.

A license has been issued by the Commission to the California Oregon Power Company, of San Francisco, covering three short sections of a constructed transmission line from Cantella to a sub-station near Delta, Cal., where connection is made with the system of the Pacific Gas and Electric Company. These three sections of line cross lands within the Shasta National Forest.

Preliminary permits have been issued covering two proposed projects on the Little Colorado River. The permits were issued to Frank G. Baum, of San Francisco.

Another preliminary permit has been issued to Mushen and Cronemiller, of Lake View, Oregon, to cover a proposed power development on Deet and Cammas Creeks in Lake County, Oregon. Two power houses developing a total of 800 hp. are to be constructed.

Coal and Iron Mines in Utah Are Inspected by Californians

Wigginton E. Creed, president of the Pacific Gas and Electric Company and the Columbia Steel Company, together with a large party of California financial and industrial leaders recently completed a tour of the Carbon county coal fields and the Iron county iron deposits in Utah.

The tour of inspection followed a conference with L. F. Rains of the Carbon Fuel Company of Salt Lake City and W. W. Armstrong, president of the National Copper Bank of the same city, regarding the establishment of a steel industry in Utah, a preliminary announcement of which appeared on page 441 of the December 1, 1921, issue of the Journal of Electricity and Western Industry. While no positive announcement has been made regarding a merger of the steel, pig iron and coal interests of California and Utah, the fact that the California men have visited the proposed field of operations is taken as indicative of the fact that a definite announcement will be forthcoming in the near future.

It is understood that the proposed plans call for the erection of a 500-ton blast furnace for the production of pig iron on the shores of Utah Lake, the construction of several steel plants, as well as a coke by-product plant, and the development of the vast iron and coal deposits in Utah. Involved in the utilization of the coal and iron ore will be the construction of a branch railroad approximately 25 miles in length from Lund in the direction of Cedar City.

With Mr. Creed on the trip were Joseph D. Grant, director of the Bank of California; Albert E. Boynton, attorney for the Hammon interests of San Francisco; John S. Drum, president of the Mercantile Trust Company of San Francisco and former president of the American Bankers' Association; Louis Sloss, president of the Northern Commercial Company; Joseph Sloss, bank director and merchant; D. H. Botchford, general manager of the Columbia Steel Company; J. D. Fenstermacher, secretary of the Columbia Steel Company, and a number of technical advisers and engineers.

The Oregon-Kalama Lumber Company, recently incorporated with a capital stock of $500,000, has entered into an agreement with the Kalama (Ore.) port district to erect a sawmill of not less than 100,000 feet capacity per day.

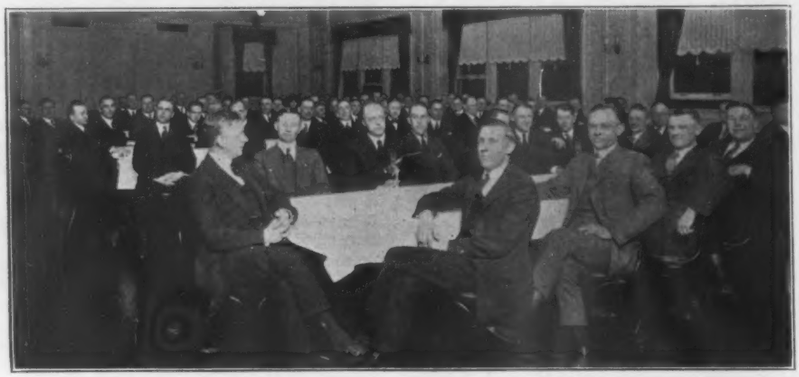
Contractor-Dealers of Oregon Hold Convention

Highly Successful Mid-winter Session Is Featured by a Large Attendance and Presentation of Electrical Home Display

By W. C. HESTON

The eleventh convention of the Oregon Association of Electrical Contractors and Dealers, held at Corvallis, Oregon, March 30 and 31, was featured by the exceptionally large attendance from every district in the state, and the presentation of a four-act playlet, "Domestic Comfort-Electrical," telling the story of a day's activities in a modern electrically equipped home, before a representative audience of architects, building contractors and home owners.

More than one hundred contractors and dealers and members of allied industries gathered for a discussion of important problems of the industry and a continuation of the association's program to further the interests of the members and the entire industry. In addition to the meetings of the executive committee and the general business meeting, and as a distinct departure from the usual procedure, there was held a public meeting at which problems of the industry as related to the welfare and interests of the general public were frankly discussed.



Delegates to the first mid-winter convention of the Oregon Association of Electrical Contractors and Dealers at Corvallis, gathered at this banquet in the domestic science hall of the Oregon Agricultural College, where the sessions were held.

The playlet "Domestic Comfort-Electrical," which was presented three times for the public in the women's gymnasium of the Oregon Agricultural College, was the first effort on the part of the electrical men to demonstrate to the public by means of a dramatic production the importance of properly electrifying the home. This exhibit carried the electrical message in a powerful manner to three audiences of approximately 600, and marks a new method of reaching the public.

The morning of the first day was devoted to an executive committee meeting followed in the afternoon by a general business meeting. The principal topic discussed at the general busines meeting was state inspection of electrical installations. Discussion of a tentative draft of a bill for presentation to the state legislature brought out some weaknesses in the proposed measure and it was decided to refer it back to the committee who drafted it for revision, and for subsequent presentation to a committee representing all interests involved, at which time final action will be taken. It was the consensus of opinion of those representing contractor-dealers, central station operatives, state and municipal authorities and the contracting public that there existed a very urgent need for a state licensing and inspection code and that a satisfactory bill should be drafted as soon as possible.

Following an excellent banquet served in the domestic science tea room of the college, in the evening, President Kerr, of the Oregon Agricultural College, congratulated the contractors and dealers' association and allied interests upon their large attendance and the very evident spirit of cooperation, and stated that he believed this cooperative spirit would not only benefit the members of the industry but the people of the state of Oregon as well. He said, "By meeting together for a discussion of your problems and opportunities and by cooperating to the fullest possible extent consistent with our democratic economic society, the electrical contractors and dealers and allies in the electrical industry can be assured of a steady, legitimate profit and the public can be guaranteed continuing, adequate service."

The feature of the evening was a speech by Dean Stephen I. Miller, of the school of business administration of the University of Washington, and secretary-manager of the Northwest Electrical Service League. Mr. Miller said in part:

"As we move into the new cycle of prosperity it is essential that we have a more complete understanding of the fundamentals of economics. This period while it will have its hills and vales will in general be on the gradual upward trend.

"The means of avoiding over-competition is by lifting the plane of service within the industry to the point where both the members of the industry on the one hand and the public on the other receive the maximum benefit. The electrical man must remember that profitable business requires adequate service and that the public should bear in mind that proper service for them entails a fair profit for the industry.

"It normally requires 50 years, perhaps, for an industry to become stabilized and the electrical industry has not had time to complete this stabilizing process. But it may be possible by developing the spirit of cooperation to further the progress of the industry toward this much needed stability. Cooperative organization is a slow process which should instruct us in the virtue of patience, but as the cooperative spirit gradually penetrates and permeates the entire industry we rise to that plane of service which places the industry in a position to profit, and serve."

The public meeting held the second afternoon was presided over by State Chairman J. H. Sroufe, who briefly told of the work of the association in the state and then introduced O. B. Coldwell, vice-president of the Portland Railway Light and Power Company. Mr. Coldwell, whose subject was "Public Utility Service," said in substance, "A large part of the future development of the electrical industry rests in the further saturation of the domestic appliance market and the resultant increased power consumption will hasten the day when the entire state will be adequately supplied with power lines."

Dean Stephen I. Miller, after an outline report of the work of the league for the past nine months, in which he stated that the work of the secretary-manager and the field representatives had been devoted to developing group cooperation in the industry and emphasizing to the public the value of proper electrification of the home, gave to the members of the association and visitors a powerful message on the topic, "Cooperative Organizations."

The need for continued cooperative effort in telling the public about the advantages of proper electrification of the home was emphasized by George A. Boring, manager of the Pacific States Electric Company, at Portland. He said, "The ultimate point of contact between the manufacturer, jobber, central station and contractor-dealer, on the one hand, and the consuming public on the other, is the convenience outlet, and insofar as we are able to increase the number of convenience outlets we increase the sales of domestic electric equipment and the consumption of electrical energy."

W. G. Purcell, Portland architect, representing the newly formed chapter of the Association of Building and Construction of Oregon, in a very interesting talk told of the needs of the building industry and of what the Association of Building and Construction, now a nation-wide movement, expects to do for the building industry.

At a Home Electrical supper meeting Friday evening at the domestic science hall of the college, representative contractor-dealers, central station managers and others interested in the promotion of the "Home Electrical" idea, there was valuable discussion of the effectiveness of this means of reaching the public and several electrical men announced that home electricals would be held in their communities this spring.

R. G. Emerson, Oregon representative of the Northwest Electrical Service League, who had called the meeting, outlined the experiences of successful campaigns in California, Cleveland and elsewhere; he also told how the idea was spreading over the Northwest and how the league was endeavoring to aid in the promotion of the electrical idea by means of the homes. There are in prospect for Washington and Oregon this spring from 10 to 20 homes electrical. By reaching from 250,000 to 500,000 residents of the Northwest with the home electrical idea the league and those responsible for the various exhibits will be aiding in the development of

the electrical industry to an extent which at present is immeasurable.

George Boring, as a member of the Portland home electrical committee, stated that plans in that city were well under way for a successful home to be held in June. Among others who reported home electrical programs was T. E. Preston, contractor-dealer of Silverton, Oregon, where he will personally exhibit a home during April.

The annual election held during the convention resulted in the re-election of J. H. Sroufe, as president of the state association. It was decided to dispense with the services of a paid secretary and as a result of this action, Frank R. Whittlesey, who has served several years as secretary of the association, has accepted a position as Oregon state representative of the Northwest Electrical Service League, to succeed R. G. Emerson, who has returned to the services of the league in the state of Washington.

The annual golf tournament, in competition for the handsome trophy donated by the Portland jobbers, was won by William Hagge, contractor-dealer of Marshfield, who played golf for the first time in his life, using only one club throughout the game. The much mooted question of who can play the best baseball—the contractors or the jobbers—is still unsettled, at least in the minds of the contractors, who claim they were really the victors, but the umpire, not wanting to see the jobbers defeated two years in succession, called the game a tie.

The convention was held in conjunction with the annual engineering show of the Oregon Agricultural College, and visitors were given an opportunity to see what is being accomplished by the students, and by the college as the most important educational institution in the state.

One of the features of the convention was the unusually large attendance, which was due in no small measure to the wide publicity given it in the newspapers throughout the state through the efforts of R. G. Emerson, Oregon state representative of the Northwest Electrical Service League.

Engineers employed in examining the foundation for the Priest Rapids dam, near Tacoma, have turned the attention of the Northwest to the wonderful hydroelectric possibilities of the site. This will be one of the largest projects in this country and is estimated to cost $40,000,000.

Intermountain Electrical Men Hold First Session

Rocky Mountain Electrical Cooperative League Sponsors Conference For Discussion of Problems of Electrical Industry

By M. L. CUMMINGS, JR.

Under the auspices of the Rocky Mountain Electrical Cooperative League the first annual conference of representatives of the various branches of the electrical industry in the intermountain states was held at the Newhouse Hotel, Salt Lake City, April 6 and 7. Seventy-six delegates from various sections of the intermountain country, including Utah, Idaho and near-by states, were in attendance. Many of the problems confronting the contractor-dealer, the jobber, the manufacturer, the central station, and the public in general, were thoroughly discussed, and many valuable ideas were exchanged in the spirited discussions which took place.

The first day's morning session was presided over by Edward H. Eardley, manager of the Eardley Electric Company of Salt Lake City, who is also president of the contractor-dealers' association of Salt Lake City.

P. M. Parry, commercial manager of the Utah Power and Light Company, and chairman of the advisory committee of the Rocky Mountain Electrical Cooperative League, delivered an address of welcome. His well-chosen remarks initiated the "get-together" spirit which prevailed among the delegates during all the sessions which followed.

Mr. Parry explained briefly the functions of the Rocky Mountain Electrical Cooperative League, and told of some of the things which it had accomplished during the past year, and what it expected to accomplish in the future. He particularly emphasized the necessity and the advantages of a better understanding of "the other fellow's" situation among the various branches of the electrical industry, and the closer cooperation which will result therefrom. He laid stress on the idea that the general public must also be educated to a clearer knowledge of what the electrical industry has done and is doing for mankind.

Chairman Eardley, who was introduced by Mr. Parry, spoke of the importance of the electrical business, in all its phases, in the world's activities; and of the necessity of such conferences of those directly interested in the industry.

"At no time in the history of the electrical business in these intermountain states," said Mr. Eardley, "has there been more need for just the series of meetings that have been arranged, than at the present time, and it is my humble wish that they shall be the means of implanting in our hearts the seriousness of the business in which we are engaged."

L. B. Johnson, of the General Electric Company, read an interesting and instructive paper, which included a chart lecture and discussion on the subject of "Fundamentals of Electrical Retail Merchandising." He pointed out how increased sales and increased net profit could be obtained through better merchandising methods.

Among the points brought out by Mr. Johnson were: the necessity of carrying merchandise of high quality; proper contact with the public; advertising; window display; appearance of the store; courtesy of the salesman.

"The Business Outlook" was the subject of a forceful talk by C. E. Arney, Jr., of the Seattle Chamber of Commerce. Mr. Arney spoke of the psychological factor in the business depression through which the country has passed, and stated that the business community as a whole does not realize that the actual conditions which contributed to this depression have passed, and that today the condition is more a matter of the attitude of mind rather than actual conditions.

He pointed out some of the advantages of organization in solving business problems; called attention to the unemployment situation in Seattle immediately after the close of the war, when 40,000 men were thrown out of employment suddenly as a result of discontinuance of shipbuilding. He told of the work being done by the Seattle Chamber of Commerce to relieve this situation—its home products campaign—its national advertising campaign—and how the various schools, churches and business institutions are cooperating in this work, with wonderful results.

The necessity of creating markets at home was emphasized by the speaker. "Organizations like yours," said Mr. Arney, "are capable of doing a great deal of good, provided that they always maintain a broad vision. You have come here to learn of the problems which affect the business in which you are en-

One hundred members of the electrical industry, representing the Intermountain states, gathered at this banquet at the Salt Lake Commercial Club, which was held in conjunction with the first annual conference to be held under the auspices of the Rocky Mountain Electrical Cooperative League. Problems relative to every phase of the industry were discussed. Similar meetings will be held every year.

gaged. I think it is very opportune that you should give some consideration to the larger problems of building up the entire community, not only in the effect that it will have on your business directly, but for the effect upon the other fellow's business, and the general development of our great western country."

Mr. Arney spoke of the vital importance of the passage of the Smith-McNary bill to the development of the West.

He also urged hearty support for the Utah Manufacturers' Association in the home products campaign which they are about to launch.

The afternoon session, which was presided over by B. E. Rowley, of Salt Lake City, district manager of the Edison Electric Appliance Company, was opened with a well-prepared paper on the subject of "Extension of League Activities and Correlation of Branches of Industry" by P. L. Goddard, who has recently assumed the duties of executive secretary of the Rocky Mountain Electrical Cooperative League. Mr. Goddard summarized the work of the league since its organization, and outlined a program of activities for the future which it is expected will accomplish wonderful results. He pointed out, in a very convincing manner, how the various branches of the industry are dependent, one upon the other, for success. He strongly emphasized the necessity for cooperation and the good-will spirit among the electrical fraternity, and pledged his best efforts in the furtherance of the work of the League.

"Possibilities for an Electrical Exposition" was the subject discussed by R. J. Dinwoodey of the Intermountain Electric Company of Salt Lake City.

Mr. Dinwoodey outlined the favorable results which could be accomplished from an electrical exposition, and urged that the matter of conducting such an exposition in Salt Lake City in October of this year, possibly in connection with the state fair, be given serious consideration.

The sentiment among the delegates present was strongly in favor of such a project, and it was decided that a committee from the league would consider the proposition in detail and report at a later date.

The morning session of the second day was presided over by C. B. Hawley, general manager of the Intermountain Electric Company of Salt Lake City.

Edward H. Eardley, who represented the contractor-dealers' association of Salt Lake at the recent meeting of the National Association in New York, spoke on the subject of "Observations—with National Committee of Contractor-Dealers."

Mr. Eardley explained that the conference which he attended was not the national convention, but was assembled to discuss the subject matter to be presented at the national convention to be held in Cincinnati in October.

The menace confronting the business of the electrical dealer, in the importation of cheap foreign-made appliances, was pointed out by the speaker, when he said:

"In New York today, yesterday, and for the last two weeks it has been possible to buy as fine a finished flat iron as has ever been on this market, for $10.00 a dozen. They are being sold—a shipload of them, two hundred thousand irons—not only irons, but other heating appliances. If that condition is allowed to go on with our appliance business our wonderful factories will have to close their doors, because we cannot compete with that sort of a condition. Our markets are being flooded with things made in foreign countries under sweat-shop methods, at a price an American cannot compete with. For my part, I am through buying junk."

"Industrial and Commercial Lighting" was the subject of an interesting paper, which was illustrated by the use of slides, by E. A. Evans of the Salt Lake City office of the Westinghouse company.

Mr. Evans covered his subject very extensively, and by the use of illustrations called attention to the various correct and incorrect methods of lighting stores and show windows. He recommended that the subject of lighting be given more attention in the future, and showed how improved lighting means more business to the store-keeper, more business for the dealer, increased load for the central station, and a better feeling on the part of the public.

The last session was presided over by R. M. Bleak, superintendent of lighting and appliance sales of the Utah Power and Light Company.

H. M. Ferguson, Salt Lake division manager of the Utah Power and Light Company, covered the subject of "The Modern Electrical Home" in a manner which brought out very forcibly the enormous possibilities of developing business for the electrical people through selling the electric idea to the public.

"The home presents today," he said, "the biggest possible field for new work. Lighting, of course, in an industrial way, and the power business, have been particularly well handled. The means of utilizing power have been very well covered, and there is not the same chance for work along lines of that sort because of the development that has taken place within the past few years.

"Heretofore the home has not been a very serious part of the problem. That business has not been particularly attractive, because it formerly meant heavy investment and small earnings. However, with the coming of the various electrical devices the whole problem has changed. The fact that there are so many thousands of homes in proportion to the handful of customers of other descriptions makes it now a very wonderful field to think about and to work in."

Mr. Ferguson called attention to the large increase in customers of the power company who are taking lighting and fuel service, and using more current as a result of more extensive use of appliances.

He emphasized the necessity of electrical men, particularly those who in contact with the public, being fully educated on the various phases of the question before attempting to educate the public or to sell the public the electric idea. He suggested the organization of classes, through the Rocky Mountain Electrical Cooperative League, to be attended by meter readers, wiremen, and such other men as come directly in contact with the public, and where no department heads would be present, such classes to meet monthly or semi-monthly, and take up various subjects under the direction of persons to be selected by the League.

Mr. Ferguson also recommended the appointment of an inspector by the League, whose duties would be to approach the owners of homes in course of construction, or those who contemplated building homes, go over their plans, advise them as to proper wiring plans, convenience outlets, and point out any defects that might appear. His advice could, of course, either be followed or rejected by the owner.

The program was concluded with an entertaining and instructive talk by H. T. Plumb, of the General Electric Company of Salt Lake City, on the subject of "Modern Electrical Achievements." Mr. Plumb outlined some of the wonderful developments which have been made in the use of electricity, improvements in various apparatus during the past year, and emphasized the "Safety First" idea.

A feature of the convention was the banquet on the evening of April 6 at the Commercial Club, which was attended by 100 guests. Musical entertainment was furnished by a jazz orchestra and a quartet, the guests indulged in singing and attempts at singing, and there was general jollification, good-fellowship and "get-together." E. H. Eardley was toastmaster.

"A complete success," was the unanimous opinion of those in attendance at the first annual conference of the electrical interests of the intermountain section.

It is felt by the members of the Rocky Mountain Electrical Cooperative League that the foundation has been laid for a greater development of the industry, through better understanding of its various phases, and through cooperation of its various branches, to the end that each and every member thereof, and the public in general, will benefit.

It is planned to hold such conventions annually in the future.

Denver Electrical Home Ready For Visitors on May 8

After numerous delays, the first electrical home in Denver is to be opened to the public on May 8, according to the latest report of the Electrical Cooperative league in that city. Originally planned for opening in the winter, it was found necessary and later advisable to defer the opening until a logical date in the spring season. With the proper time having been reached, the advisory committee of the league is reported to have completed all details for the exhibition, which will run until June 4.

H. D. Randall of the General Electric Company and one of the directors of the Electrical Home Building Company, which financed the project, has been appointed to head the committee which will display the home. It is understood that he will be assisted by a major committee of four which will work out the schedules of demonstrations and talks of the guides who will show the house. Present plans provide for two shifts of guides, each shift requiring about nine men.

Considerable advertising has already appeared in the Denver papers, and announcements are being sent out with the May statements of the telephone company and central station in Denver relative to the opening of the home. About 20,000 stickers have also been distributed to the central stations of those communities nearby Denver inviting the customers of those localities to attend the exhibition.

Meetings of Interest to Western Men

Preparations for L. A. Electric Convention Near Completion

Preparations for the 1922 convention of the Pacific Coast Electrical Association affiliated with the N.E.L.A., to be held at the $5,000,000 Hotel Ambassador in Los Angeles on May 31, June 1 and 2, are proceedingly rapidly according to the committees in charge of the event. The convention promises to be one of the most noteworthy in the history of the organization, not only in attendance, but also in the character of the papers and reports to be presented.

In connection with the convention, the committee in charge has issued a statement relative to accomodations at the Ambassador which is intended to dispel the feeling among members of the association that rates at the hostelry are exceedingly high. It is pointed out that the highest rate charged is $5 per person per day for a double room with bath and twin beds. Meals average $4 per day. Every facility will be provided for the entertainment of the guests on the hotel grounds. There are golf links, tennis courts and a swimming pool on the grounds.

Herbert Dewes, of the Southern Sierras Power Company, who is general chairman of the convention, has announced the following committees to serve in conjunction with the sessions:

Entertainment Committee

A. E. Baron, Chairman, San Joaquin Light and Power Corporation; L. W. Davis, Westinghouse Lamp Co., W. B. Sawyer, U. S. Steel Products Co.; D. E. Harris, Pacific States Elec. Co.; W. C. McWhinney, So. Cal. Edison Co.; D. C. Pence, Illinois Electric Co.; J. G. Loomer, Western Electric Co.

Reception Committee

K. E. Van Kuran, Chairman, Westinghouse Elec. and Mfg. Co.; Garnett Young, Garnett Young Company; G. E. Abrogast, F. E. Newberry Elec. Co.; R. E. Fisher, Pac. Gas and Elec Co.; P. H. Booth, Edison Elec. Appliance Co.; Robt. L. Eltringham, Cal. Elec. Co-op. Campaign; L. M. Klauber, S. D. Cons. Gas and Elec Co.; Robert Sibley, Journal of Elec. and Western Industry; C. E. Listenwalter, Listenwalter & Gough; A. E. Morphy, So. Cal. Edison Co.; E. O. Shreve, Genl. Elec. Co.; Emmett Britton, San Joaquin Light and Power Co.; E. B. Criddle, The So. Sierras Power Co.; Geo. A. Campbell, Truckee River Genl. Elec. Co.; E. R. Northmore, L. A. Gas and Elec. Co.

Programs Committee

C. A. Kelley, Chairman, The So. Sierras Power Co.; S. J. Lisberger, Pacific Gas and Elec. Co.; J. O. Case, Genl. Elec. Co.; A. R. Kelley, So. Cal. Edison Co.; Chas. W. Walker, Ontario Power Co.; George Armstrong, Electrical World; A. T. Sanderson, Bryant Elec. Co.

Finance Committee

Henry Bostwick, Pac. Gas and Elec Co.; P. R. Ferguson, The So. Sierras Power Co.

Banquet Committee

George T. Bigelow, Chairman, The So. Sierras Power Co.; J. B. Black, Great Western Power Co.; A. E. Holloway, S. D. Cons. Gas and Elec. Co.; F. A. Leach, Jr., Pac. Gas. and Elec. Co.; M. E. Newlin, San Joaquin Light and Power Corp.; H. L. Harper, Western Electric Co.; C. B. Hall, Illinois Elec Co.

Out-of-Door Sports Committee

A. W. Childs, Chairman, So. Cal. Edison Co.; K. E. Van Kuran, Westinghouse Elec and Mfg. Co.; C. C. Hillis, Elec. Appliance Co.; J. W. Burns, So. Cal. Edison Co.; H. H. Courtright, Valley Electric Supply Co.; R. J. Cash, Jr., Gen. Elec. Co.; W. S. Berry, Western Elec Co.

Registration and Attendance Committee

C. D. LaMoree, Chairman, Clapp & LaMoree; C. E. Spaulding, Gen. Elec. Co.; Leon S. Heseman, The So. Sierras Power Co.; L. F. Galbraith, Pac. Gas and Elec. Co.; C. H. Thrane, Pac. States Elec. Co.; J. F. Pollard Coast Valleys Gas and Elec Co.

Automobile Transportation Committee

P. H. Ducker, Chairman, So. Cal. Edison Co.; H. E. Sherman, Illinois Elec. Co.; C. O. Hutching, So. Cal. Edison Co.; J. C. Rendler, So. Cal. Elec Co.; J. S. Brittain, The So. Sierras Power Co.

Transportation Committee

Frank J. Airey, Chairman, Pacific States Elec. Co.; J. W. Redpath, Cal. State Assn. of Contrs. and Dirs.; H. M. Sessions, So. Cal Edison Co.; H. H. Courtright, Valley Elec. Supply Co.; A. B. Vandercook, Western Elec. Co.

Convention Committee

E. P. Markee, Edison Lamp Works; Robinson Farmer, Cal. State Assn. Contractors and Dirs.; C. E. Young, Pac. Gas and Elec Co.; W. H. Talbot, S. D. Cons. Gas and Elec Co.

Hotel Committee

R. A. Hopkins, Chairman, Westinghouse Elec. and Mfg. Co.; H. C. Rice, So. Cal. Edison Co.; E. G. Snow, Pacific States Elec Co.; J. M. Morris, Westinghouse Elec. and Mfg. Co.

Electric Club Is Organized by Pasadena, Cal., Interests.

The mutual interest of the electrical contractor-dealer and the central station in developing the maximum yearly use of electricity by domestic consumers was recently pointed out by C. W. Koiner, city manager of Pasadena, California, before a recent meeting of the newly organized Pasadena Electric Club. Mr. Koiner stated that his records would show that electric appliances have increased the average yearly consumption from 436 kw-hr. per meter, in 1910; to 1013 kw-hr. per meter in 1921; and states further that he believed that an additional 1,000 kw-hr. per meter were possible if contractor-dealers would seriously push the sale and use of small household refrigeration units. He gave some interesting figures from typical performances of this neglected end of the electrical business, to show the savings and convenience which would accrue to the public with the universal adoption of this appliance.

R. H. McCormick of the Electric Shop was elected president of the new organization while the other officers elected were vice-president, B. W. Whipple of H. L. Miller and Company; secretary-treasurer, J. C. Jacobs of the Jacobs Electric Company. Following organization meeting, congratulations were wired to Lawrence W. Davis, special representative of the National Association of Electrical Contractors and Dealers, as it was the opinion that his constructive efforts during a recent visit to California were largely responsible for the formation of the club.

Northwest League Emphasizes Home Electrification

A continuation of the program of the Northwest Electrical Service League to bring the idea of proper electrification of the home before contractors and architects was accomplished by means of a joint meeting of the electrical men and those interested in building construction at Bellingham, April 12th.

This meeting, which was attended by about fifty, was devoted entirely to the discussion of building prospects in the Bellingham district for 1922 and the importance of having homes properly electrified. R. G. Emerson, a fieldman for the Northwest Electrical Service League, spoke on the subject, "The Electrical Home," stating that the message which the electrical industry was endeavoring to bring before the general public, and particularly those interested in home building, was that the modern home "requires ample provision of convenience outlets so that all the various 'electrical domestic servants' can be used to the fullest extent and also that each room may be properly illuminated in accordance with the requirements of that room and the taste of the occupants."

Four authorities on hydroelectric development in California told San Francisco business men what private initiative has done in the upbuilding of one of the state's greatest industries at a recent meeting of the San Francisco Down Town Association. The speakers were John A. Britton, vice-president and general manager of the Pacific Gas and Electric Company, A. Emory Wishon, general manager of the San Joaquin Light and Power Corporation; Mortimer Fleishhacker, president of the Great Western Power Company and M. M. O'Shaughnessy, city engineer of San Francisco who is in charge of the Hetch-Hetchy project.

The United Fuel and Power Company of San Diego has applied to the California State Railroad Commission for an order authorizing it to sell its electric light and power distribution system in the city of Coronado to the San Diego Consolidated Gas and Electric Company. The price agreed upon between the two utilities is given as $100,000 cash. The sale includes physical properties, privileges, franchises and good will. The San Diego Consolidated already supplies Coronado with gas and it is seeking to acquire the electric business by this purchase.

COMING EVENTS

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION
Annual Convention—Boise—June 7-10, 1922

PACIFIC COAST ELECTRICAL ASSOCIATION, AFFILIATED WITH N. E. L. A.
Annual Meeting—Los Angeles, May 31-June 2, 1922

NATIONAL ELECTRIC LIGHT ASSOCIATION
Annual Convention—Atlantic City—May 15-19, 1922

Personals

Clare N. Stannard, the newly elected vice-president and general manager of The Denver Gas and Electric Light Company, entered the public utility business when he was 21 years old and after eight years with various gas, electric and street railway companies, entered the employ of his company's predecessor in Denver as a collector. After 24 years service, during which he went from the cashier's department to that of commercial manager, he has been made the directing head of one of the most progressive public utility companies in the United States. He

C. N. STANNARD

was born in New York state and his first problem was with a bank in Binghampton, but after a year he entered the service of the gas and electric company of that city. Street railway operation then took his attention and after a brief period in the south, he went to Denver where he secured a position with the city tramway company. One year later he went with the Denver Consolidated Electric Company, the forerunner of the present company, which later added the gas and steam heating services of that city. Until his new appointment, Mr. Stannard was secretary of the company and also of the Summit County (Colo.), Power Company. He is an active member of the Denver Civic and Commercial Association and is also treasurer of the Denver Tourist Bureau. He is past president of the Denver Rotary Club and was a delegate to the international convention in Edinburgh, Scotland, last summer.

Claus Spreckels, formerly secretary and treasurer of the San Diego Electric Railway, has been chosen general manager of the lines. Mr. Spreckels career with the company has been marked by his speedy advancement. At the age of twenty he refused a chance of a college education to become bookkeeper with the company, believing that he could learn more of the actual operation of the lines by taking this step. The plan proved to be correct, for in 1911 he was made secretary and treasurer of the company. He succeeds **William Clayton** in his present position.

B. S. Hughes, chief engineer, Zaremba Company of Buffalo, N. Y., is a recent Los Angeles and San Francisco visitor. Mr. Hughes has been very much interested in looking up electrochemical processes in the West.

Arnold Pfau, consulting engineer with the hydraulic department of the Allis-Chalmers Manufacturing Company, is a recent San Francisco visitor, having come to the Pacific Coast to visit the Hetch-Hetchy project and be present at the ipening of bids for the Moccasin Creek power plant. According to Mr. Pfau his company has just received an order for three 18,000 horsepower turbines for installation in Japan.

Kunihiko Iwadare, president of the Nippon Electric Company of Tokyo, Japan; **Genichiro Ahata,** superintendent, and **L. W. Tucker,** chief engineer of the same company arrived in San Francisco recently from Nipon. They will inspect various hydroelectric developments in California before leaving for the East on a business trip.

J. J. Foley and **W. R. Newcombe,** officials of the Western Electric Company of Chicago, are recent San Francisco visitors. The two are making a tour of various western market centers investigating business conditions.

Arthur E. Rowe, sales manager for the Garnett Young Company of San Francisco, is taking an active part in the San Francisco Forward Movement, which has been organized to promote home building. In an analysis of the situation he has predicted that new building in San Francisco for the year 1922 will be in excess of $66,000,000.

Harry B. Gear, secretary of the Commonwealth Edison Company, **R. F. Schuchardt** of the same concern, **Britton I. Budd** and **Harley A. Johnson** of the Chicago Elevated Railroad, **Frank E. Goodnow** of the Public Service Company of Northern Illinois, **C. H. Jones** of the Chicago, North Shore Railroad, and **D. L. Smith** of the Chicago Electric Railroad, constituting the Chicago Committee of Electrification, recently completed an extensive tour of the lines of the Chicago, Milwaukee and St. Paul Railroad, and the Butte, Anaconda and Pacific lines. The committee is engaged in the study of various phases of railway electrification before making a report on the proposed electrification of all steam lines operating into Chicago. They were conducted on their tour by R. Beeuwkes, electrical engineer for the C. M. & St. P.

H. J. Gundlach, general manager of the Mine and Smelter Supply Company of Denver and **George Lowe,** purchasing agent of the same company, recently completed an extensive tour of the manufacturing centers of the East. During the trip they inspected the East Pittsburg plant of the Westinghouse Electric and Manufacturing Company and were also shown the recently completed radio broadcasting station, KDKA, one of the most powerful in the country.

H. S. Lane, former assistant superintendent of electrical distribution in the San Jose district of the Pacific Gas and Electric Company, has been shifted to the San Francisco office as assistant engineer of maintenance. He has been succeeded in San Jose by **C. O. Bossemeyer.**

Frank Bonner, assistant chief engineer, U. S. Forest Service, with headquarters at Washington, D. C., is a recent Pacific Coast visitor, where he spent much time in the Forestry headquarters of the various divisions of the West reviewing the road building situation upon national forest reserves, which he has specially in charge this season.

Max J. Kuhl, counselor of the Industrial Association of San Francisco, was one of the principal speakers before a recent two day conference of industrial experts from twenty-six western cities, held in Salt Lake recently under the auspices of the Utah Associated Industries. Mr. Kuhl described the progress which has been made in the effective installation of the American plan in the Pacific Coast city. Nine western states were represented at the sessions and plans were worked out to perpetuate the conference.

D. H. Braymer, co-editor of Electrical World, has been made editorial and publishing director of Electrical Review and Industrial Engineer, one of the recent acquisitions to the McGraw-Hill publications. He will, however, still act in an advisory editorial capacity to Electrical World.

George Bell, formerly with the California Commission of Immigration and Housing, is today an industrial consultant, performing unusually timely and helpful work for the Industrial Association of San Francisco. During the past year San Francisco has become outstanding among the cities of the Pacific Coast in the progressive way in which the labor difficulties have been adjusted by the installation of the American plan, in all building construction in the bay region. Particularly is this manifested in building activities in San Francisco itself, which today stands

G. L. BELL

forth in building activities, exceeding all records of years past. Mr. Bell as industrial consultant for the Industrial Association is one of those thoughtful workers who is assisting in putting over this new idealism in industrial relations. Mr. Bell was also a member of the arbitration committee which brought about a settlement in the building strike a year ago. On another page of this issue of the Journal of Electricity and Western Industry may be found in some detail his particular ideals along these lines.

George Mattis, former city engineer of Oakland, California, has been engaged by the Key Route to make an extensive survey of the proposed Goat Island terminal on San Francisco Bay. The federal government will hold a hearing in San Francisco in the near future for the purpose of hearing argumeuts relative to the project.

C. E. Listenwalter of the firm of Listenwalter and Gough, jobbers of electrical supplies in Los Angeles, is in receipt of a postcard from a German firm at Zeitz, Germany, in which the postcard cost two hundred and forty phennige of postage to get the message to him. Charlie is wondering if it cost two hundred and forty to send a postal, how much it would cost to send a letter?

George A. Damon, consulting electrical engineer of Los Angeles, is one of the vice-presidents of the Regional Planning Conference of Los Angeles county which has just completed the second of its meetings. This commission is attempting to solve the zoning, highway, transportation, sanitary, flood control, school and finance problems of the southern California metropolis, problems in which the engineer can be of the greatest help.

S. W. Bishop, executive manager of the Electrical Co-operative League of Denver, Colorado, has recently given a talk before the Wyoming Public Utilities Association, which had its convention in Cheyenne. Mr. Bishop is a powerful leader in the Inter-Mountain District and is doing much good toward the forwarding of the method electrical in Colorado and Wyoming particularly.

Al C. Joy, former publicity manager for the California Raisin Growers' Association, is now publicity manager for the San Joaquin Light and Power Corporation of Fresno, California. Mr. Joy was for many years a newspaper

A. C. JOY

man in San Francisco previous to undertaking the work of making the California raisin famous throughout the world. He was best known as sporting editor of the San Francsco Examiner. Mr. Joy goes to his new office with a wealth of knowledge concerning the upbuilding of California, especially the San Joaquin Valley. He is an ardent advocate of co-operation and has been a staunch worker in effecting an understanding between the farmer of the "back country" and the busineess men of the Coast cities.

Robert Sibley, editor of Journal of Electricity and Western Industry, will be the principal speaker before the Technical Section of the Northwest Section of the Northwest Electric Light and Power Association in its annual convention at Boise, Idaho, on June 9th. Mr. Sibley will speak on the subject, "The Failure of the Hydro-Electric Commission of Ontario, Both from Economic and Engineering Standpoints."

H. W. Crozier, manager of the San Francisco office of Sanderson and Porter, while serving as a member of the Board of Alumni Visitors of the University of California, made a proposal to the Mechanics Institute of San Francisco that they donate annually the sum of $7,500 to the University of California to found a chair to be known as the Mechanics Institute Professorship of Mechanical Engineering. It is extremely probable that the proposal will be adopted and a close union thereby brought about between the University of California and the Mechanics Institute of San Francisco.

E. C. Larue, hydraulic engineer with the U. S. Reclamation Service and one of the foremost authorities on the Colorado River, recently addressed a gathering of Utah engineers in Salt Lake City on the problems relative to the development of one of the West's greatest sources of hydroelectric energy.

John B. Miller, president of the Southern California Edison Company, is at present in New York City on financial business for his company.

Edwin O. Edgerton, president of the East Bay Water Company and former president of the California State Railroad Commission, gave an interesting address before the San Francisco Commonwealth Club recently on the subject of "The Present and Future Needs of the East Bay Cities," in conjunction with a program relative to the future water supply of the cities adjacent to San Francisco Bay.

Lloyd N. Robinson, formerly with Stone and Webster, Inc., is now chief electrical engineer for the Merced Irrigation District which is at present constructing a $12,000,000 irrigation and power project in the San Joaquin Valley in California. Mr. Robinson is at present engaged in making the preliminary layout for the power house that the district will install in conjunction with the large storage reservoir near Exchequer on the Merced River.

S. L. Sinclair, engineer with the Minidoka Pumping Project of Rupert, Idaho, is a recent California visitor. Mr. Sinclair is spending several months in California in an intensive study of hydroelectric development in the various sections of the state and will take a special course at the summer session of the University of California this year.

C. A. Kofoid, professor of zoology at the University of California and assistant director of the Scripps Institution for Biological Research, has been appointed to a committee of the National Research Council for the purpose of devising protective measures against marine borers. The teredo causes millions of dollars' worth of damage to wharves and other submerged wooden structures in the harbors of the Pacific Coast.

Archibald S. Downey, one of the foremost industrial figures in Seattle, has recently been elected president of the Northwest chapter of the Associated General Contractors of America at a convention held in Portland. Since coming to Seattle in 1899, Mr. Downey has been president of the Seattle Section of the American Society of Civil Engineers, vice-chairman of the industrial bureau of the Seattle Chamber of Commerce, and during the war was chairman of the power plant committee of the Fuel Administration Board for the state of Washington. During the war the construction company which

A. S. DOWNEY

Mr. Downey organized carried out a large constructional program for the U. S. government at the Puget Sound Navy Yard and at Forts Worden, Casey and Flagler. Mr. Downey is a staunch advocate of the policy that men identified with the constructional activities of a community should give unsparingly of their time in the civic and industrial upbuilding of their city.

John L. Harrington, noted consulting engineer of Kansas City, is a recent Pacific Coast visitor and is interested in both the Oakland inner harbor bridge and the Dumbarton bridge proposals which have been receiving such active consideration recently in the San Francisco Bay region.

A. B. West, vice president and general manager of the Southern Sierras Power Company, answered to the classication of "Ice" at the recent Rotary meeting in San Francisco. This is the first time the frigid character of the climate in Southern California has thus been openly confessed.

Warren McBryde, secretary-treasurer of the California-Hawaiian Sugar Company and president of the Industrial Association of San Francisco, is taking an active part in adjusting the present labor difficulties in the San Francisco Bay region.

Paul B. McKee, vice-president and general manager of the California Oregon Power Company with headquarters at Medford, Oregon, is one of those who has substantial part in opening up the famous "Marble Halls of Oregon," as Joaquin Miller long ago dubbed the remarkable caves in Josephine County in Southern Oregon. The wonderful scenic beauty of these caves presents a veritable fairyland to those who have paid a visit to the "pipe organ" and the "twin sister" in the caves.

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

SAN FRANCISCO

There has been a slight increase in the volume of trade during the month, but results have fallen short of expectations, due, in part, to continued cool and rainy weather. Spring ranch work is still delayed, and snow in the mountains has prevented any mining work of consequence.

Carry-over stocks of practically all farm products in the state—including wool, canned goods, wheat, barley and rice—are below normal, and this fact contributed to a strengthening of prices. Advances in the prices of farmer's products, accompanied by moderate declines in various other commodities have been of some benefit to the farmer, and this is reflected in reduced borrowings of country banks.

Building operations for the month reached a record figure for two years, and manufacturing generally is showing slight gains.

Among jobbers in millinery, Spring wearing apparel, electrical and radio supplies, hardware and building materials, trade is fairly satisfactory, but in many other lines the movement is slow, and travelers handling anything that might be termed a luxury, report results disappointing. Cillections are slow.

Twelve hundred and fifteen real estate sales in San Francisco for March record a total value of $13,735,965. These are the largest totals, in number of sales and value, to be recorded in any one month since March, 1906, when there were 1259 sales valued approximately at $18,250,570. Building is still active with a total operations for the month of $3,975,241.

The bond market continues strong and active, with heavy buying of Liberties and a demand for the better class of foreign government securities, many of which have touched a new high level. This extraordinary demand for securities is said to represent for the most part true investment support, coming from legitimate outside sources, as distinguished from professional traders and speculators. There has been relatively little profit-taking on the advance and present holders show an inclination to retain securities for income producing purposes.

LOS ANGELES

Utilities are continuing to attract the attention of supply firms and manufacturers by reason of large orders for new equipment and betterments to systems. Street railway transportation companies have placed orders for hundreds of car motors, together with several completely automatic substations.

The city of Los Angeles is rushing construction work on the distributing lines in order to complete the cut-over of the Edison system recently purchased. Bids for equipment, transformers, and line materials are being called for, many orders having been placed already.

Actual construction work has been started on the 20,000 spindle cotton mill; plans call for the mill to be in partial operation by early fall. The moving picture industry is once more in full operation with more than 100 companies in production work among the studios and surrounding country.

Weather to date continues cool and generally favorable to rapid plant growth but slow maturing to fruit and vegetables, thought to be due largely to the heavy deposits of snows in the mountains from the high Sierras to the Laguna Mountains of San Diego county. At Summit, California, the total depth is reported as 162 inches or more than 50 per cent above the average of several years. Ample irrigation water, water for power and replenishing of underground supplies for wells are the promising aspects of this condition. Local government authorities report the condition as indicative of high-water run-offs and floods on the lower Colorado River when the melt begins.

Bank clearings continue to average 10 to 15 per cent above last year for the same period. Building permits show this activity to be unprecedented, with the total volume hovering around the $10,000,000 a month mark.

SEATTLE

Statistics compiled after a canvass of construction activities throughout the state, brings to light the fact that more than $50,000,000 will be spent in the state of Washington this year in new building work. This amount is 30 per cent greater than was expended in 1921. Public improvement work in Seattle and other large cities throughout the state will require the greatest expenditure of funds. It is estimated that more than $20,000,000 will be spent for this class of work alone. Building construction is second in importance, with highway construction third. Buildings planned or now building in the state, exclusive of Seattle, are estimated to cost approximately $9,000,000, while structures now building in Seattle will cost about $6,000,000. Buildings projected for construction this year in Seattle are estimated to cost between $6,000,000 and $7,000,000. Highway work planned and under way in the several counties to be completed this year will exceed $6,500,000, and already the commission has expended approximately $2,000,000.

In Seattle and the Puget Sound country, nearly all the slack has been taken from the employment situation, and it is believed within the next 30 days, unemployment will be reduced to a minimum. The demand from logging camps, mills, farms and irrigation districts is daily increasing.

The demand for West Coast lumber has outstripped the productive capacity of the mills, according to the weekly trade announcement of the West Coast Lumbermen's Association. Shipments of West Coast lumber are increasing, the rail movement showing an especially marked increase, indicating that the farming states have come back in the market as the result of the improvement in demand for agricultural products. Nearly every large lumber manufacturing plant in the Northwest is now operating to full eight-hour capacity.

The predicted improvement in weather conditions is reflected in the general increase in retail and wholesale trade in the city, and merchants and dealers are optimistic over the prospects for early spring.

PORTLAND

General business conditions seem to be improving slightly. Lumber production for several weeks past has been nearly normal, ranging from 5 to 8 per cent below normal. Many mills which have been shut down for nearly a year are resuming operations. The weather has moderated so that practically all of the logging camps are now in operation. This together with building construction has very much relieved the unemployment situation. The value of building permits for Portland for March were the greatest for any month in the history of the city. Bank clearings continue to hold up well and port business is good.

Electrical manufacturers' agents and jobbers report business improving materially in the past week or two. Both inquiries and actual sales are active. Contractor-dealer store sales are inactive. Fixtures are exceptionally good, and wiring demands for residence and apartment work are active. Demand for radio equipment continues unprecedented.

The recent gains in the lumber industry are maintained. For the last three months, the orders received have exceeded the output of the mills which holds at better than 90 per cent of normal. For the first 13 weeks of the year, the cut was 1,001,266,834 feet, orders booked were 930,632,791 feet, and shipments were 923,144,556 feet. More inquiry is coming frim the agricultural states of the Middle West, and the demand from California is better than at any time since the first of the year. Fair orders are coming from Atlantic Coast points for the better grades.

There is little export demand for wheat, and the slackness of the flour trade has caused many of the mills to close down, while others are grinding

only part time. Shipments in the past month from Portland were 1,513,089 bushels of wheat and 146,191 barrels of flour. Half of the wheat went to Oriental ports.

SALT LAKE CITY

From practically all sources comes the report that business in the intermountain section is improving steadily, although the improvement is slow.

The copper mining industry is gradually resuming its stride, and the lead and silver producers are operating in a very satisfactory manner.

The unempoyment situation is becoming less serious, due to resumption in mining activity, and also on account of public improvements which are getting under way. A large road building program is also scheduled, and in some localities this work has started, although bad weather conditions have delayed it considerably. Building activity is increasing and within the next thirty days many new homes will be under construction.

An important event in the electrical industry was the first annual electrical conference held at Salt Lake City, April 6 and 7 under the auspices of the Rocky Mountain Electrical Cooperative League. Many problems of interest to the retailer, the jobber, the manufacturer and the central station were covered in the discussions.

Electrical dealers are pushing the sale of seasonal appliances, such as vacuum cleaners, and in fact the sale of other appliances has improved to some extent. An educational program covering the convenience outlet in the home is one of the activities planned for the future.

Collections are slightly better than for some time past, and bank deposits show healthy increases.

A good year is predicted for the farmers, the wool men and the livestock men.

The general tone is decidedly better. The future looks bright.

DENVER

New building activities are increasing daily. Retail sales in all lines are picking up. The aspect is more optimistic than it has been for the past six months.

From the electrical viewpoint, however, there is a marked concern over the price which is being paid for wiring both buildings and houses. A competitive condition has arisen, especially in the bungalow class of work, where established contractors cannot get the work because of the fearfully low estimates submitted by non-association contractors.

Denver's first electrical home, the annual "Clean-Up, Paint-Up" campaign, and a Better Homes movement are aiding materially in stimulating interest in things electrical.

There are few failures in business reported and money is more liquid at the banks. Constructive developments are planned by a number of electrical firms, and the building of the Moffat tunnel project is practically assured in the passing of the necessary bills by the special session of the state legislature which has just adjourned.

Conditions in Twelfth Federal Reserve District

Current Summary Shows Improved Banking Conditions While Activity in Building Operations and Lumber Mills Are Striking Industrial Developments of Past Month

The monthly report on business and agricultural conditions issued by John Perrin, chairman of the board and Federal Reserve Agent of the Federal Reserve Bank of San Francisco, indicates several tendencies of the past month which will have a salutary effect on business in general. The Twelfth Federal Reserve District includes the states of California, Washington, Oregon, Idaho, Utah, Nevada and Arizona. A summary of the report follows:

The banking situation in this destrict continues to improve. Borrowings from the Federal Reserve Bank of both city and county member banks combined fell from $61,106,000 on March 8th, to $49,025,000 on April 12th, a decline of $12,081,000, or 19.7 per cent. This reduction was accomplished at least in the case of the country member banks at a season of the year when the requirements of their customers are usually heavy, and indicates a growing ability on the part of these banks to meet customers' needs without securing outside assistance.

The most striking industrial development in recent weeks is the record activity in **building operations.** Figures of building permits for March were, in point of value, the largest figures ever reported in this district exceeding the previous record month of October, 1921, by 17.5 per cent. Compared with the month of March a year ago, this year's figures exhibit an increase of 47.9 per cent in value and 14.7 per cent in number, indicating a period of unusual activity in construction lines during the summer and fall.

Lumber and Mining

Among other industries of the district **lumbering** is most active. Production during March was approximately 90 per cent of normal, the highest percentage reported by this industry in the past 16 months. New orders received by mills in the four principal lumber associations were 22.4 per cent greater than March production. Five more of the largest **copper mines** in the district have announced the resumption of operations and on April 1st eleven of the fifteen principal mines which closed down one year ago were again working their properties, although on a greatly curtailed scale. Sales of **electric power** for industrial purposes in February continued on the same high level as in January, primarily reflecting the activity in lumbering and mining.

Agriculturally there have been few developments during the month. In many sections the winter season extended well into March and farm work has been delayed for two to three weeks. The winter wheat crop now appears to be in better condition than on December 1st, but it is not expected that the record crop of last year (78,000,000 bushels), will be equalled. The present outlook for the deciduous fruit crops of the district is excellent, with the exception of apricots, the yield of which has been reduced as much as 60 per cent in some sections by attacks of brown rot and killing frost. Preliminary estimates of cotton and sugar beet plantings indicate a slight increase in acreage of cotton in the principal growing sections and a reduction of approximately 25 per cent in the acreage of sugar beets, compared with last year. **Prices** of agricultural products, while they have not continued the steady gains which characterized their movement in the first two months of the year, have fluctuated at levels appreciably higher than those of January 1st.

An increased demand for unskilled laborers, partly seasonal and partly due to greater productive activity in the district, has increased the number of men employed, and all states report that the peak of **unemployment** has apparently been passed.

Retail and Wholesale Trade

Trade at retail during the month was 6.2 per cent less in value than in March, 1921, but the comparison loses much of its significance when it is remembered that Easter buying occurred in March last year and will be largely reflected in April sales this year. After making due allowances for declines in retail prices of from 5 to 10 per cent over the year period it is probable that the physical value of business in March, 1922, was at least equal to that in March, 1921. **At wholesale,** trade in general was dull, and did not compare favorably with 1921 figures either in value or physical volume of sales.

Debits to individual accounts in 20 principal clearing house centers were only 6 per cent less than in March, 1921. This is approximately the same percentage of decline as in the wholesale and retail trade during the year period, and if allowance be made for a smaller amount of income tax payments in March, 1922, than in March, 1921, it would appear that the volume of business represented by these debits was greater in 1922 than in 1921.

Business failures in March were greater in number and, with the exception of January of this year, greater in amount of liabilities than in any other month during the present readjustment period.

Denver Is Experiencing Record Breaking Building Boom

With the building permits for the month of March breaking all records for the past twelve years with a total of $1,573,450, constructional activities for Denver during 1922 are expected to reach the record total of $20,000,000, according to officials of that city. The highest total in the history of the city, July, 1909, with its $2,240,000 in permits, is expected to be passed before the present year is ended.

The number of permits issued totaled 605, of which 218 were for homes. The volume of building in this and other types of smaller structures is indicated in the fact that but one large permit was issued, that for the L. R. Steel building, which will cost $300,000.

The Elwell-Parker Company, Cleveland, manufacturers of electric industrial trucks and tractors, has developed an improved type charging plug for electric battery driven trucks. The new device incorporates several new ideas in design, chief among which is its interchangeability.

The Arrow Electric Company, Hartford, Conn., is issuing a small bulletin called "The Outlet," which purports to carry "inside information for the jobber's salesman." Written in a humorous vein, the bulletin carries some pertinent information for the members of the electrical industry to whom it is addressed.

The Edison Electric Appliance Company, Chicago, announces a new Hotpoint automatic heating pad to meet the increasing demand for this type of appliance. The pad is ten inches in diameter, and weighs one pound. Severa new ideas have been incorporated into its design.

Travis Welch, 180 New Montgomery street, San Francisco, has been appointed western agent for the **Beverly Lights Corporation** of Providence, R. I., manufacturers of a line of unique ornamental lighting fixtures.

The Electrical Specialty Company, Inc., factory distributors with offices in San Francisco, announce the removal of its offices and stock rooms from the Underwood Building to 75 Fremont street. New and larger quarters will permit the company to better handle its growing business.

The Manhattan Electrical Supply Company, Inc., New York, manufacturers of electrical specialties, announces the placing on the market a new radio headset designed to meet the demands which have developed in this line during the past few months. The headset is super-sensitive and has a sanitary headband.

C. J. White is opening an electrical supply store at Ocean Blvd. and Parker Avenue, Long Beach, California.

Payne Dean Limited, New York City, manufacturers of electrically controlled valves, have issued bulletin No. 100-A, describing the various features of Dean control. The valves are applicable to both steam and water systems.

The Westinghouse Electric and Manufacturing Company, East Pittsburg, has perfected a new tumbler water heater which is designed to heat a small quantity of water quickly and efficiently. The heating element is inserted in copper tubing bent to furnish a large heating surface. The heater is designed to operate at 350 watts on a circuit of 110 to 120 volts.

The Wagner Electric Company, St. Louis has issued a bulletin entitled "Light for Motion Picture Projection," which describes the progress which has been made in this phase of illumination as well as sets forth the many features of the Wagner White Light converter unit.

The Uehling Instrument Company, Patterson, New Jersey, has issued bulletin No. 112 describing the company's carbon dioxide equipment for checking and reducing stack losses in fuel operated power plants.

G. F. Roberts and A. H. Roberts have opened a new store at Garfield and Ramona Blvd., Ramona, California, where a full line of electrical supplies will be carried.

Manufacturer, Dealer, and Jobber Activities

T. S. Halverson has opened a new electrical supply business at 212 East Second Street, Pomona, California.

Robert A. Bosch has opened an electrical supply store at 928 Geary Street, San Francisco, California.

The Electric Heating and Manufacturing Company, Seattle, is preparing to market a new type of heater to be known as the "Circo-Flector." It is the type known as a reflecting electric radiator and radiates heat in all directions. It has a capacity of 660 watts and operates on a voltage ranging from 100 to 120. It weighs but four pounds.

The Illinois Electric Company's Los Angeles branch has announced the purchase of a block of property at Boyd and San Pedro streets where a modern warehouse and offices will be erected as soon as plans are completed, according to C. B. Hall, local manager. This is the first step in a program of expansion in the Southwest territory. The new building will have more than 35,000 sq. ft. of floor space with provisions for future additions.

E. A. Robertson of the **Malonev Electric Company** of St. Louis, manufacturers of transformers, has announced that he will shortly make an extended trip through Mexico, visiting practically all of the large cities for the purpose of investigating the trade situation in the southern republic.

O. E. Crites, sales manager for the Sheridan County (Wyoming) Electric Company, has resigned to take over one of the Colorado districts for the Hoover vacuum cleaner.

The Central Electric Supply Company has been organized in Denver with a capitalization of $15 000 by E. V. Beck and others. The offices of the new company will be located at 315 Colorado Building.

The Diamond K Electric Shop of which F. Karbe is proprietor, has opened a new electrical supply store in Riverside, California.

The Sprague Electric Works of the **General Electric Company** announces the completion of a new narrow-unit, safety type panelboard, which possesses all of the features of regulation-sized boards. Tumbler type switches are one of the features of the new board.

The Westinghouse Electric and Manufacturing Company has announced several changes in the personnel of its western branches which include the appointment of **J. R. Deering** as office manager of the Los Angeles branch. **H. S. Walker** has succeeded **M. E. Lanning** as promotion manager in the Denver office.

The F. W. Wakefield Brass Company of Vermilion, Ohio, manufacturers of lighting specialties, announces considerable increases in business since the beginning of the new year. Output since the first of January is about 100 per cent above the same period last year.

William Thomas is reported to have opened a new store carrying a full line of electrical supplies at 7740 Santa Monica Blvd., Hollywood, California.

The Ward Leonard Electric Company, Mt. Vernon, New York, has placed on the market a new vitrohm radio battery charger for use on a 110-volt direct current line. The apparatus is furnished with a reliable ammeter and a six-foot extension cord with separable plug.

C. W. McNeill and **R. C. Surface** have established a contractor-dealer business to be known as the Liberty Electric Company at 322 No. Santa Fe Avenue, Pueblo, Colo.

The H. E. Gleason Company, Seattle lighting fixture manufacturers, has moved from 1517 Second Avenue to 418 Union street, where new and larger quarters will enable the company to better care for its growing business.

The Pacific States Electric Company, Pacific Coast jobbers, has recently taken on the line of Red Spot lighting specialties manufactured by the F. W. Wakefield Brass Company of Vermilion, Ohio.

The Poindexter Supply Company of Denver has installed a printing department especially for the issuance of its lighting fixture catalogs.

The Trumbull Electric Manufacturing Company, Plainville, Conn., has placed on the market a new line of externally operated clip type "C" switches, 30 to 200 amperes, 250 to 500 volts. The switch represents an addition to the company's safety type, machine made switches. Circular No. 53 describes the product.

The Condit Electrical Manufacturing Company, Boston, announces the manufacture of a new type oil circuit breaker known as D-22. The device has been designed to meet the increasing demand for a higher interrupting capacity switch of common frame and construction. The circuit breaker is rated at 2000 amperes at 15,000 volts.

THREE MUSKETEERS

If Dumas were called upon to name the paraphernalia with which these three gentlemen are equipped he would utterly fail. The gentleman who is attempting to emulate "Babe" Ruth with the big stick is J. H. ("Harry") Sroufe, Portland contractor-dealer, and president of the Oregon Association of Electrical Contractors and Dealers. But "Harry" cannot play ball. R. G. Emerson, field man and publicity expert for the Northwest Electrical Service League, who is next to him, and F. R. Whittlesey, secretary of the association, can vouch for that. Messrs. Emerson and Whittlesey are not holding overgrown golf balls.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

THE PACIFIC NORTHWEST

EUGENE, ORE. — Ground will be broken shortly after May 1 for the new plant of the Eugene Farmer's Creamery to cost $50,000.

CORVALLIS, ORE.—The city council is considering plans for the enlargement and improvement of the municipal water system, the work to cost $100,000.

HOOD RIVER, ORE.—The Emry Lumber and Fuel Company has completed plans for a new concrete resaw, planning mill and box factory plant which will be two stories high.

HOQUIAM, WASH. — Work of electrifying the plant of the Carlisle-Pennell Lumber Company at Carlisle, and installing a monorail system for handling lumber, which will be started immediately, will cost about $250,000.

PORT ANGELES, WASH.—The Washington Pulp and Paper Company, as the result of an exceptionally good year, has announced that plans are being prepared for the construction of an additional paper plant at its mills here.

CHELAN, WASH.—The Chelan Irrigation and Power Company has been formed by 30 business men of Chelan. The construction of a power plant on Railroad Creek, which will supply power to the district at reasonable rates, is proposed.

LA GRANDE, ORE.—The George Palmer Lumber Company has announced a program of extensive improvements for its mills in this district which include the construction of ten miles of railroad and the construction of two large bridges.

SEATTLE, WASH.—The city council has passed a bill providing for the construction of a permanent steel bridge across the west waterway at West Spokane Street, to cost $500,000. The Board of Public Works is now calling for bids on towers, piers, etc., in connection with the work.

SEATTLE, WASH.—Contract for the proposed $350,000 five-story fireproof orphanage to be built for the Sisters of the Sacred Heart, Seattle, has been let to Scherer & Carlson, contractors, 111 Pine Street. The building will be 230x70 feet in size, modernly equipped throughout.

PORTLAND, ORE.—The Oregon Washington Railroad and Navigation Company plans the construction of a bridge across the Columbia River between Willard and Hedges which will cost approximately $1,500,000. Other improvements to the lines of this company during the Spring will bring the total expenditure up to $3,500,000.

WALLA WALLA, WASH.—Contract for the construction of the proposed new twin reservoir by the city of Walla Walla, as a part of its new water system, has been let to the Pacific Coast Paving Company of Tacoma, on a bid of $176,841. The reservoir will have a capacity of 15,000,000 gallons, and the work involves 70,000 cubic yards of excavation, and 4,000 cubic yards of concrete.

ABERDEEN, WASH.—A $1,000,000 corporation for the establishment here of a plant for the manufacture of furniture and fixtures for sea-going vessels, and more especially to manufacture a patent table and a patent bed for use on such vessels, filed articles of incorporation recently under the name of the Marine Equipment Company. Incorporators are A. Bullinski, A. F. Gross, William Mattis, et al.

CHEHALIS, WASH.—Immediate installation of a $15,000 standard street lighting system has been approved by property owners, and the council plans to proceed with this work immediately.

SEATTLE, WASH.—The Union Bridge Company, Central Building, Seattle, has completed plans for a proposed $250,000 toll bridge to be built across the Pend d'Oreille River at Newport, Washington. Construction of the proposed bridge will be financed by Spokane, Newport, Sandpoint, Priest River and other towns in Washington and Idaho. The Inter-State Toll Bridge Company of Priest River, Idaho, Peter Young, is promoting the project. The general plans for the structure provide for a bridge 1250 feet long, of steel construction, resting on concrete piers.

THE PACIFIC CENTRAL DISTRICT

EUREKA, CAL.—A tanning extract plant eclipsing in size any in this portion of the state will be constructed here by Fred S. Blair at a cost to exceed $75,000.

TRUCKEE, CAL.—Filipic Brothers have announced that a new ninety room hotel to care for winter visitors will be erected here this summer at a cost in excess of $125,000.

RICHMOND, CAL. — The Luning Mineral Products Company, manufacturers of paint pigments, intends to treble the capacity of its plant at Twenty-first and Chanselor Avenue.

FRESNO, CAL.—The Southern Pacific Co. has announced that it has leased the property adjoining the depot to the F. H. Buck Packing Company for the erection of a packing house.

SAN FRANCISCO, CAL.—A building permit has been issued to Kincannon and Perego for a $100,000 six-story and basement reinforced concrete apartment house to be erected at 159 Sutter Street.

YUBA CITY, CAL.—An appropriation of $70,000 has been made by the Sun-Maid Raisin Growers Association for the erection of a packing plant in this city, according to Harry Piper, local manager.

YUBA CITY, CAL.—The Pacific Gas and Electric Co. has announced that a new substation to cost $70,000 will be erected here to supply power to Sutter County. It will have a capacity of 2,000 hp.

WATSONVILLE, CAL. — Plans have been completed by C. M. Gay and Son of Los Angeles for a $180,000 refrigerating plant to be erected here for Stephen Scurich. The building will be of reinforced concrete and steel.

TERRA BELLA, CAL.—The Richgrove-Jasmine Citrus Association has been incorporated here for the purpose of constructing a $50,000 packing house at Richgrove. Frank Daybell is chairman of the board of directors.

RICHMOND, CAL.—The Decoro Manufacturing Company has purchased a site at the corner of Nevin and Second Stretts, for the erection of a factory. Plans are being prepared, according to C. S. Renwick, an official of the company.

SAN FRANCISCO, CAL.—R. S. Browne has received a building permit for the erection of a six-story and basement apartment house at Post and Mason Streets to cost $200,000. Plans have been prepared by T. Patterson Ross, 310 California St.

LODI, CAL.—Turner & Dahnkin, operators of a chain of motion picture theaters throughout central California, have announced that a new theater will be constructed in this city at a cost of $100,000. The theater will be of brick, 60 by 120 feet.

SAN FRANCISCO, CAL.—A building permit has been issued to the Walton N. Moore Drygoods Co., for an eight-story and basement reinforced concrete wholesale drygoods house at Mission and Eighth Streets, to cost $380,000. The Foundation Co. has the general contract.

REDLANDS, CAL.—J. H. Strait & Co., shippers of deciduous fruits, has announced that plans have been prepared for the erection of a 20-ton dehydrator for handling apricots, peaches and apples. It is planned to have the plant in operation by the opening of the fruit season.

STOCKTON, CAL.—Bonds will be voted on May 2 for $1,300,000 for the erection of a dam on the Calaveras River for a municipal water supply. Also for $125,000 for the extension of police and fire alarm systems and $50,000 for the construction of a bridge over Mormon Channel.

MODESTO, CAL. — Riverbank has been chosen as the site for the Santa Fe Railroad's new ice plant for stocking refrigerating cars. Over 600 hp. in electric motors will be installed, necessitating the erection of a new substation by the Pacific Gas and Electric Company, which serves this district.

SACRAMENTO, CAL.—Plans are practically completed for the $500,000 hospital to be erected on L Street by the Sutter Hospital Association, comprised of forty-five local physicians. Frederick H. Meyer of San Francisco is the architect. The new hospital will include every type of modern equipment.

REDDING, CAL.—W. H. Sampson has appeared before the supervisors for franchises to run power lines in Shasta County in conjunction with a hydroelectric project which he proposes to undertake in this county and in Trinity County at a cost in excess of $3,000,000. July 6 is the date for selling the franchise.

SAN FRANCISCO, CAL.—The Pacific Gas and Electric Company has announced a reconstruction program in Stanislaus county totaling $300,000, which includes a new 60,000-volt line from Modesto to Hughson, new substations at Hughson, Riverbank and Turlock, and the installation of new switching equipment at the Modesto substation.

BAKERSFIELD, CAL.—Construction of a precooling plant to cost $1,500,000, building of a railroad seven miles long from Edison on the lines of the Southern Pacific Company, and the intensive cultivation of 3,400 acres of vineyards, are disclosed in a $4,000,000 development plant proposed by the De Giorgio Farms Company, of which Joseph De Giorgio is president.

THE INTERMOUNTAIN DISTRICT

FALLON, NEV.—Bids will be received until May 2 by City Clerk Grace Wildes for a pumping plant for the municipal water system.

OGDEN, UTAH.—Water supply from the city wells will be increased 50 per cent through the installation of an air lift system which comprises two 50-hp. motors, two compressors and an air receiver. The equipment will be installed on six of the city wells.

LOGAN, UTAH.—Improvements are being planned to the lighting system on Fourth North Street and Main Street as a result of a petition to the city council.

BOISE, IDA.—The state bureau of highways has completed plans for a three-span, all-steel bridge to be erected over the Clearwater River at Spaulding at a cost of $91,000.

MISSOULA, MONT.—Construction of a modern apple packing plant at Woodside is being contemplated by the Equity Growers and Shippers Association, according to E. M. Gerer,, who says that the plant will be equipped with a modern conveyor system.

STEVENSVILLE, MONT.—The board of directors of the Bitter Root Irrigation district proposes to bond the district for $1,000,000 for the complete rebuilding of all flume work, the repair of the Lake Como reservoir and the construction of an office building and warehouse for the district.

BUTTE, MONT.—The Northern Pacific Railroad will expend approximately $700,000 during the coming year for the installation of electric block signals on its lines in North Dakota, Montana and Washington, according to J. S. Kemp, general agent in Butte. A total of 562 miles of lines will have the signals installed.

THREE FORKS, MONT.—The Three Forks Irrigation District has been formed for the irrigation of 20,00 acres of land between here and Willow Creek. Plans are being made for the construction of a dam 120 feet high at the junction of Norwegian and Willow creeks. Willis Buttleman, Ray Matter and H. F. Nelson represent the new district.

DENVER, COLO. — Construction will begin July 1 on the half million dollar Patterson Building, according to Architect Fred E. Mountjoy. The building will be ten stories high and will be constructed of sandstone and brick. Special features will be refrigerating plant for furnishing ice water, and a thermostatic control for heat in all of the offices.

BONNERS FERRY, IDA.—H. H. Hughes, manager of the city water and light plant, has started work on the Moyie Falls power plant with a gang of twenty men. The plant will have a capacity of 550 hp. with provisions for the installation of another similar unit as soon as the demand is sufficient to warrant it. The first unit will cost approximately $25,000.

DENVER, COLO.—The C. S. Lambie Construction Company has been awarded the general contract for the construction of the $350,000 garage for the Super-Service Motor Association, according to J. R. Noland, manager. The building will have three floors and a basement and will house approximately $75,000 worth of modern machinery for the repair of motor vehicles.

SALT LAKE CITY, UTAH.—H. R. Waldo and B. A. MacKenzie, both of 1309 Walker Bank Building, the offices of the Telluride Power Company, have filed applications with the Utah state engineer for the use of water for power purposes in the southern end of Sevier County. Mr. MacKenzie's application is for 15 second-feet of water from Fish Creek for the generation of 1,200 hp. under a head of 1,182 feet, while that of Mr. Waldo is for 100 second-feet from the Sevier River for the developement of 900 hp. under a head of 240 feet.

THE PACIFIC SOUTHWEST

SAN BERNARDINO, CAL.—The city engineer is preparing estimates for the 300 whiteway posts which it is proposed to erect on E Street between Mill and Highland Avenues.

LONG BEACH, CAL.—A 12-story hotel and office building will be erected at the corner of American Avenue and Broadway for Edward John, according to plans of W. Horace Austin. Traction elevators, vacuum system, refrigerating plant and special wiring for office equipment are some of the features of the specifications.

SAN DIEGO, CAL.—A new store and office building will be erected by Ed. Stricher, merchant, at 745 E. Street. The building will be of brick with ornamental front and will cost about $25,000.

SAN PEDRO, CAL.—Sixth Street between Pacific Avenue and Harbor Boulevard is to have a Novolux installation or ornamental lighting, according to ordinances which have been passed by the city council.

RIVERSIDE, CAL. — Thirty-three one-light concrete standards will be erected on Locust Street according to the announcement of the city clerk, as part of the improvements now under way for this street.

ORANGE, CAL.—The Standard Oil Company will build an office and warehouse building, together with several large storage tanks, at West Walnut and North Cypress Streets. The cost is estimated at $25,000.

LONG BEACH, CAL.—A stock company is proposed by J. M. Eaton for the purpose of erecting a 12-story hotel and apartment. Option has been secured on the property at Ocean Boulevard and Marine Way.

LOS ANGELES, CAL.—The Citizen's Independent Ice and Cold Storage Company are to build an addition to their present plant on Rio Street, according to plans now being prepared by the architect, John E. Kunst.

GLENDALE, CAL.—Colorado Boulevard will have an ornamental lighting system between the intersections of Grand Boulevard and Central Avenue. Five-light iron standards have been adopted for this installation.

AVALON, CAL.—Additions to the city water works system in the way of motor-driven pumps and piping together special fittings are contemplated in the call for bids by the city clerk. No estimate of the cost is announced.

PHOENIX, ARIZ.—Building activities have taken a big jump up in the last few months. During March, $384,558 was the total value of permits and the projects planned call for that much more during the months to follow.

SAN DIEGO.—Muehleson Tent and Awning Company have started the erection of the new building to house the business of the firm at 1050-54 Second Street. The plans call for brick stores at an estimated expense of $40,000.

SAN DIEGO, CAL.—Contracts for the six fire-proof barrack buildings at the naval training station were awarded to Lange and Bergstrom of San Diego and Los Angeles, at a figure said to be $487,000. Work will start at once.

LOS ANGELES, CAL.—The Union Pacific Railway has secured 200 acres at Hobart for the purpose of building a freight terminal and switching yards. Ultimate plans call for the expenditure of $6,000,000 for shops and terminal facilities.

SANTA BARBARA, CAL.—The new Bernhard Hoffman residence will cost $90,000. The contract has been awarded to Snook and Kenyon, with offices in this city. Building is of hollow tile and will require six months to construct.

SIERRA MADRE, CAL.—Property owners are completing the petitions for the installation of ornamental lighting on West Central Avenue. The system is estimated to cost $1,200 when complete. G. T. Farman is chairman of the committee.

COMPTON, CAL.—Robert L. Jones, superintendent of the Compton Electrical Specialties Company, is authority for the statement that his company will expend $22,500 on a two-story factory building to be erected on North Wilmington Street.

LOS ANGELES, CAL.—Architect Aleck E. Curlett is completing the plans for the 13-story building to be erected for the Sun Realty Company. The contract for the steel frame has been awarded to the Llewellyn Iron Works. Other bids are to be received for the balance of the work in the immediate future.

ANAHEIM, CAL.—The Union Pacific Railway will build stations at Fullerton and Anaheim in connection with the extension of its line from Whittier to Santa Ana. Plans will be under the direction of the engineering department of the railway.

LOS ANGELES, CAL.—The Los Angeles Gas and Electric Company will erect a fire-proof building at the corner of Duncommon and Jackson Streets to house new compressor equipment. The structure will be of steel frame and trusses and is estimated at $60,000.

SANTA ANA, CAL.—This city and Anaheim will join in the necessary expense for providing large additional capacity to the outfall sewer system. More than $500,000 will be expended by the two cities in new sewer mains and a new flow line to the ocean.

PHOENIX, ARIZ.—Architects Lescher, Kibbey and Mahoney are preparing the plans for a $30,000 school and auditorium building for the city of Ashfork, Arizona. They are also supervising architects for the new $40,000 school building at Prescott, Arizona.

YERMO, CAL.—H. V. Shraven of Salt Lake City was awarded the contract for the Union Pacific depot at a price of $35,000. The plans include hotel facilities and freight storage rooms. Plans are under the supervision of John Parkinson of Los Angeles.

PASO ROBLES, CAL.—The Almond Growers Association of the city have contracted with Jas. L. McLaughlin of San Francisco for the erection of the new packing house. Construction is to be of reinforced concrete and will cost $34,000 exclusive of equipment.

LOS ANGELES, CAL.—C. A. Fellows was the successful bidder for the contract covering the 75 miles of main-line double-tracking for the Santa Fe Railway east of Yampal, Ariz. The price is said to have been $8,000,000, and will require twelve months to complete.

LOS ANGELES, CAL. — A five-story club building and auditorium will be constructed for the Friday Morning Club. Plans are being prepared by architects Allison, Allison and Allison. The building and furnishings are expected to cost in the neighborhood of $300,000.

SAN BERNARDINO, CAL.—One hundred and fifty thousand dollars will be the cost of the new hotel to be constructed on E Street near Third, according to the announcement of C. B. Phillips who has purchased the 92 feet frontage at the above location. The building will be four stories high.

LOS ANGELES, CAL.—Architect Sam Heiman, with offices in this city and San Francisco, is preparing plans for the new 12-story building to be erected on Spring Street between Sixth and Seventh for Dunn-Williams of San Francisco. The structure is to be of steel frame with terra cotta facing.

ARROWHEAD LAKE, CAL.—McNeal Swasey and H. C. McAfee of Los Angeles have been commissioned to prepare plans for 100 cottages of one, two and three rooms each to be erected at Camp Fleming. A lodge building will also be constructed. The improvements were authorized by R. S. Turner.

LOS ANGELES, CAL.—The I. W. Hellman interests will erect a 12-story office building to cost $1,500,000 at the corner of Seventh and Hope Streets. The top floors are leased to the Union Oil Company of California. The structure is to be of steel frame, and the general contract is in the hands of MacDonald and Kahn.

FRESNO, CAL. — San Joaquin Light and Power Corporation have received permit from the Federal Power Commission for the development of the North Fork and the West Fork of the Kings River in California. This is part of the $50,000,000 program which this company has planned and on which much construction has already been undertaken.